

GAME PLAN, INC.  
ATTILA PINBALL  
(MODEL 260)

INSTALLATION  
AND  
REPAIR MANUAL

GAME PLAN INC.  
1515 W. FULLERTON AVE.  
ADDISON ILL. 60101

02-30094A

## INSTALLATION AND REPAIR MANUAL

### INSTALLATION INDEX

I.	GENERAL INSTALLATION .....	3
II.	GENERAL GAME OPERATION.....	3
III.	FEATURE OPERATION & SCORING.....	4
IV.	ACCOUNTING FUNCTIONS.....	5
V.	GAME ADJUSTMENTS.....	7
	A. PLAY FIELD ADJUSTMENTS.....	7
	B. MPU SET UP SWITCHES.....	7
	CREDIT/COIN.....	7
	FREE PLAY.....	9
	EXTRA BALL.....	9
	MAXIMUM CREDITS.....	9
	BALLS PER GAME OPTION.....	9
	REPLAY OR FREE BALL AWARD.....	9
	MATCH FEATURE.....	10
	CREDITS FOR EXCEEDING HIGH SCORE.....	10
VI.	ROUTINE MAINTENANCE ON LOCATION.....	11

### REPAIR INDEX

I.	INTRODUCTION.....	12
II.	MODULE REPLACEMENT DIAGNOSTICS.....	12
III.	COMPONENT REPLACEMENT	
	DIAGNOSTICS (MPU BOARD).....	16
	A. POWER UP AND CTC1 PROCEDURE.....	17
	B. CTC2 PROCEDURE.....	18
	C. CMOS RAM PROCEDURE.....	19
	D. NMOS RAM PROCEDURE.....	19
	E. I/O PROCEDURE.....	19

F.	ROM PROCEDURE.....	19
G.	OUTPUT PROCEDURE.....	20
IV.	MSU SOUND BOARD DIAGNOSTICS.....	21
A.	POWER UP & RESET PROCEDURE.....	22
B.	ROM 2 PROCEDURE.....	22
C.	ROM 1 PROCEDURE.....	23
D.	RAM PROCEDURE.....	23
E.	INTERRUPT PROCEDURE.....	23
F.	PIA 1 PROCEDURE.....	23
G.	PIA 2 PROCEDURE.....	24
V.	POWER SUPPLY DIAGNOSTICS.....	24
VI.	SOLENOID & SWITCH IDENTIFICATION.....	26
A.	TABLE 1 - SOLENOID IDENTIFICATION.....	26
B.	TABLE 2 - SWITCH IDENTIFICATION.....	27

## INSTALLATION

### I. GENERAL INSTALLATION

Remove backbox, cabinet and legs from the shipping container. Bolts required for assembly, tilt ball and game ball are shipped inside the cashbox. Mount the legs to the cabinet. Pull the line cord through the hole in the cabinet and place it in the slot at rear of the cabinet. Place backbox on the cabinet and mount with the four bolts provided. Pull cables up through the hole in the bottom of the backbox and plug into mating connectors in backbox. Note the connectors are color coded to prevent connection errors. Connect ground braid to backbox shielding screw.

Check all connectors to ensure that none vibrated loose during shipping. Check playfield wiring and cabinet wiring for shipping damage. Check that all fuses are firmly in place. Adjust the leg levelers, check the tilt bob adjustment and insert roll-tilt ball. Lower the playfield, and place the game ball in the shooter alley. Install the captive ball in the lane.

Plug the game into a grounded outlet only of specified voltage. Do not remove the ground plug or use a cheater plug to defeat the grounding system.

The game is now ready to power up and check out. Refer to section IV, routine maintenance on location, for check out.

### II. GENERAL GAME OPERATION

Turn on the on-off switch located under the cabinet near the right front leg. The displays should stay blank for approximately 7 seconds. During this time the MPU circuit board is exercising its self diagnostic routine, the game over tune will play and the displays will alternately flash zeros and high score to date.

Coin the game. The game should play the coin sound and increment the credit display. Press the credit button. The start of game sound should play, the credit display should decrement, the first player should flash for the player up, ball in play 1 should be lit for number of players and the ball should be served to the shooter alley if sitting in the ball return hole.

Pressing the credit button again will cause the number of players to be incremented with each depression to a maximum of four.

### III. FEATURE OPERATION & SCORING

The H-U-N lanes score 1,000 pts. or 2,000 pts. when flashing and light the associated bonus lamp and lane lamp. All three made increases bonus multiplier (twice maximum). Lit lane and bonus lamps are carried over to next balls. Three times through all the H-U-N lanes lights the special lamp.

The T-H-E captive balls have the same function as the above lanes.

The A-T-T-I-L-A targets score 1,000 pts. and light the associated target and bonus lamps. All A-T-T or ILA down lights a thumper bumper 1,000 when lit lamp. Each time all down lights one lamp from bottom to top bumper.

The loop lane rollover scores 10, 20, or 30,000 points depending on lit lamp.

The spinner lane scores 1000 points for each revolution.

The special/extra lane scores 25,000 points extra ball, or special depending on lit lamp.

The extra outlane scores 1,000 points or extra ball when lit.

The special outlane scores 1,000 points or special when lit.

All bonus for current ball is collected when the ball falls in the outhole. Completely lit horizontal lanes score 25,000 pts. times the bonus multiplier. Completely lit vertical lines score 50,000 pts. times multiplier. Lines are carried over to the next ball for "additional bonus" after present ball bonus collect. In between balls, the lamps return to the game over pattern.

The extra ball lamp lights when all bonus target lamps are lit along with all H-U-N or T-H-E. Maximum of two extra balls per game.

Exceeding high score to date awards credits, if optioned, at the end of the game and the displayed high score to date is automatically updated.

Tilting the game results in loss of current ball and the flippers and all playfield features go dead. Slamming the machine results in loss of the game, and the game goes into a delay mode for approximately 15 seconds.

At the end of the game, the game over sound plays and the match number shows in the ball play display if optioned. The game goes into a game over delay for approximately 5 seconds and then begins alternately flashing last game score and high score to date on the displays.

#### IV. ACCOUNTING FUNCTIONS

Note: The game must be in the game over mode before entering into the accounting routine. A new accounting reset button has been added to the coin door. It provides the same function as S-33 on the MPU board.

The accounting routines are entered by pressing the test switch inside the coin door. The number of the accounting function is shown in the

ball in play display and the count for that function is shown on all four players displays. Continued pressing of that test switch will cause the game to cycle through all the accounting functions. If the game is left in one of the accounting functions, it will automatically return to game over after approximately 30 seconds.

Any accounting function can be reset by pressing S33 on the MPU board or by pressing the reset switch on the coin door. While that particular accounting function is being displayed.

Replay levels and high score to date are reset to 100,000, all other accounting functions are reset to zero.

The sequence of accounting functions are as follows:

1. Coin Counter #1
2. Coin Counter #2
3. Coin Counter #3
4. Total Plays
5. Total Replays
- \*6. Replay Level #1
- \*7. Replay Level #2
- \*8. Replay Level #3
- \*9. High Score To Date
10. Number of times high score to date has been exceeded
11. Number of Credits On Game

...Credit button.

\*Resets to 100,000 by pressing reset switch on coin door or

S-33 on MPU board, can be incremented 10,000 points for each depression of the credit button. By pressing the credit button to increment replay level by 10,000 until the one million score is passed. AT this point any level showing on the display will actually be one million + the level. Eliminating the 1st replay level eliminates all the replay levels because the 2nd level cannot be reached until the 1st level has been achieved, and the 3rd level cannot be reached until the 2nd level has been achieved. TO AVOID ACCIDENTALLY SETTING REPALY LEVELS AT OVER ONE MILLION ALWAYS PRESS THE COIN DOOR RESET SWITCH OR S33 ON THE MPU BOARD FIRST WHEN LOWERING LEVELS.

When reading counters 1 through 5, 10 and 11 do not include the units digit which is always zero.

## V. GAME ADJUSTMENTS

### A. PLAYFIELD ADJUSTMENTS

The left and right outlane openings are adjusted by moving the adjacent post back or forward in its slot. A smaller opening to the outlane will increase playing time and scoring.

### B. VOLUME ADJUSTMENT

The volume control for the microprocessor sound unit is located on the Tilt Block assembly in the cabinet and may be accessed through the coin door. Turning the control clockwise increases volume, counter-clockwise decreases volume.

### C. MPU SET UP SWITCHES

The MPU P.C. board has 32 set up switches that allow play to be customized to the location. The switches are contained in four switch packs numbered S1-8, S9-16, S17-24 and S25-32. Switch selectable options are credits per coin, tune options, maximum credits allowed, 3 or 5 balls per game option, replay or free ball award, match feature, and credits for exceeding high score.

#### CREDITS/COIN ADJUSTMENT

S9 through S12 select the credits per coin chute 2. Switch setting and resultant per coin as follows:

S12	S11	S10	S9	CREDITS/COIN
OFF	OFF	OFF	OFF	SAME AS COIN CHUTE #1 SETTING
OFF	OFF	OFF	ON	1/1 COIN
OFF	OFF	ON	OFF	2/1 COIN
OFF	OFF	ON	ON	3/1 COIN
OFF	ON	OFF	OFF	4/1 COIN
OFF	ON	OFF	ON	5/1 COIN
OFF	ON	ON	OFF	6/1 COIN
OFF	ON	ON	ON	7/1 COIN
ON	OFF	OFF	OFF	8/1 COIN
ON	OFF	OFF	ON	9/1 COIN
ON	OFF	ON	OFF	10/1 COIN
ON	OFF	ON	ON	11/1 COIN
ON	ON	OFF	OFF	12/1 COIN
ON	ON	OFF	ON	13/1 COIN
ON	ON	ON	OFF	14/1 COIN
ON	ON	ON	ON	15/1 COIN

S1 through S5 select the credits per coin for chute 1.  
 S17 through S21 select the credits per coin for coin chute 3.  
 Switch settings and resultant credits per coin are identical for  
 coin chutes 1 and 3 and are as follows:

#### CREDITS/COIN ADJUSTMENTS

COIN CHUTE	SWITCHES					CREDITS/COIN
#1	5	4	3	2	1	
	21	20	19	18	17	
	OFF	OFF	OFF	OFF	OFF	3/2 COINS
	OFF	OFF	OFF	OFF	ON	3/2 COINS
	OFF	OFF	OFF	ON	OFF	1/ COIN
	OFF	OFF	OFF	ON	ON	1/2 COINS
	OFF	OFF	ON	OFF	OFF	2/ COIN
	OFF	OFF	ON	OFF	ON	2/2 COINS
	OFF	OFF	ON	ON	OFF	3/ COIN
	OFF	OFF	ON	ON	ON	3/2 COINS
	OFF	ON	OFF	OFF	OFF	4/ COIN
	OFF	ON	OFF	OFF	ON	4/2 COINS
	OFF	ON	OFF	ON	OFF	5/ COIN
	OFF	ON	OFF	ON	ON	5/2 COINS
	OFF	ON	ON	OFF	OFF	6/ COIN
	OFF	ON	ON	OFF	ON	6/2 COINS
	OFF	ON	ON	ON	OFF	7/ COIN
	OFF	ON	ON	ON	ON	7/2 COINS
	ON	OFF	OFF	OFF	OFF	8/ COIN
	ON	OFF	OFF	OFF	ON	8/2 COINS
	ON	OFF	OFF	ON	OFF	9/ COIN
	ON	OFF	OFF	ON	ON	9/2 COINS
	ON	OFF	ON	OFF	OFF	10/ COIN
	ON	OFF	ON	OFF	ON	10/2 COINS
	ON	OFF	ON	ON	OFF	11/ COIN
	ON	OFF	ON	ON	ON	11/2 COINS
	ON	ON	OFF	OFF	OFF	12/ COIN
	ON	ON	OFF	ON	ON	12/2 COINS
	ON	ON	OFF	ON	OFF	13/ COIN
	ON	ON	OFF	OFF	ON	13/2 COINS
	ON	ON	ON	OFF	OFF	14/ COIN
	ON	ON	ON	ON	ON	14/2 COINS
	ON	ON	ON	ON	OFF	15/ COIN
	ON	ON	ON	ON	ON	15/2 COINS

#### FREE PLAY OPTION

The game has provision for allowing free play. When the free play is on, credits are decremented normally until 0 credits, then pressing the credit button puts 99 credits on the game and

they continue to be decremented.

FREE PLAY	S8
ON	ON
OFF	OFF

#### EXTRA BALL

The playfield yellow extra ball lights appear after making certain combinations of targets and lanes as explained in the game play description. S14 enables or disables the feature.

EXTRA BALL	S14
ON	ON
OFF	OFF

The maximum number of credits that will be accepted by the game either through the coin switch or replay award are controlled by S26 and 27. Switch Settings are as follows.

MAXIMUM CREDITS	SWITCHES
27	26 2
10	OFF OFF 0
20	OFF OFF 0
30	ON OFF 0
40	ON ON 0

#### BALLS PER GAME OPTION

# BALLS PER GAME	24	23
5	ON	ON
3	ON	OFF
2	OFF	ON
1	OFF	OFF

#### REPLAY OR FREE BALL AWARD

The game is designed to award either a replay free ball, 50,000 points or no award at three selectable score levels or through specials gained during the play of the game.

AWARD	S29	28
REPLAY	ON	ON
EXTRA BALL	ON	OFF
50,000 pts.	OFF	ON
NO AWARD	OFF	OFF

## MATCH FEATURE

When the match feature is ON, a random number appears in the ball in play display at game over. A replay is awarded if the number matches the tens digit in a player's score.

MATCH	S30
ON	ON
OFF	OFF

## CREDITS FOR EXCEEDING HIGH SCORE

The game is designed to award replays for beating the previous high score to date.

The winning score becomes the new high score to date.

CREDITS	S32	S31
0	OFF	OFF
1	OFF	ON
2	ON	OFF
3	ON	ON

## VI. ROUTINE MAINTENANCE ON LOCATION

The game is equipped with two separate diagnostic programs to aid in routine maintenance. The first test occurs automatically at power build up. The MPU board goes into its self-test routine, and upon successful completion plays the game over tune.

The second diagnostic program is accessed by depressing the test switch inside the front cabinet door.

NOTE: THE GAME MUST BE IN THE GAME OVER MODE.

1. Depress the test switch twelve times to access the diagnostic routine. The score display will extinguish and all feature lamps will flash. Check for burned out lamps at this time.
2. Depress the test switch again to start the score display checkout. All digits except the units digits will count through 0-9.
3. Depress the test switch again to begin the solenoid checkout. Each solenoid will actuate individually and show its number on the score displays. Refer to table 1 of repair section for solenoid numbers.
4. Depress the test switch again to start the switch Checkout. Any closed switch will show its number on the score display. Refer to table 2 of the repair section for switch numbers.

NOTE: THE BALL SHOULD NOT BE IN THE OUTHOLE DURING THIS TEST.

Depressing the test switch again puts the game back in the game over mode. The diagnostic routine should be exercised on a regular basis to ensure proper operation of the game.

## REPAIR

### I. INTRODUCTION

Repair of the game on location is by printed circuit board, solenoid, switch, or lamp replacement, or by cable harness repair. No special tools or equipment are required other than a standard soldering iron, hand tools and volt/ohmmeter.

Troubleshooting faults in the game is aided by the use of the two built in diagnostic routines. The first test is initiated automatically at power up as the MPU board exercises its self diagnostic routine. As each section of the MPU board is checked, the red LED located near the top of the board flashes for successful completion of each test. After six flashes, the game over tune plays to indicate correct MPU operation.

The second diagnostic program is entered by pressing the test switch inside the front cabinet door. Pressing the test switch 12 times will step through all the accounting functions and put the game into the diagnostic program. All feature lamps should flash. Pressing the test switch again causes the display to sequence from 0 through 9. Pressing the switch again causes all the solenoids to sequence. Refer to table 1 for solenoid numbers. Pressing the switch again causes closed switch to be displayed. Refer to table 2 for switch numbers. Pressing the test switch again will put the game back in the game over mode.

### II. MODULE REPLACEMENT DIAGNOSTICS

SYMPTON 1. Power up LED does not flash 6 times. General illumination lamps do not light.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A. Power Supply Incorrect		Refer To Power Supply Diagnostics.

SYMPTOM 2. Power up LED does not flash 6 times. General illumination lamps do not light.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	+5V Incorrect	Measure +5V $\pm$ .25V at TP1 of MPU board. If incorrect refer to power supply diagnostics.
B.	24VDC Incorrect	Measure 24VDC $\pm$ 6V at J1-3 of MPU Board. If incorrect refer to power supply diagnostics. If correct replace MPU Board.

SYMPTOM 3. Power up LED flashes 6 times, game over tune does not play correctly.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Incorrect output from MPU Board.	Replace MPU Board
B.	Faulty Sound Board	Replace Sound Board

SYMPTOM 4. One or more but less than 15 feature lamps do not light.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Burned Out Bulb	Replace bulb
B.	Faulty lamp driver board	Replace lamp driver board

SYMPTOM 5. More than 15 lamps do not light.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Faulty Lamp Driver Board	Replace Lamp Driver Board

SYMPTOM 6. One display board shows incorrect data during sequencing.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Faulty Display Board	Replace Display Board
B.	Faulty MPU Board Output	Replace MPU Board

SYMPTOM 7. All display boards show incorrect data during sequencing.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Faulty MPU Board Output	Replace MPU Board

SYMPTOM 8. One solenoid does not operate.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Faulty Solenoid	Replace Solenoid
B.	Faulty Solenoid Driver Board	Replace Solenoid Driver

SYMPTOM 9. More than one solenoid does not operate.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Faulty Solenoid Driver Board	Replace Solenoid Driver Board
B.	Faulty MPU Board Output	Replace MPU Board

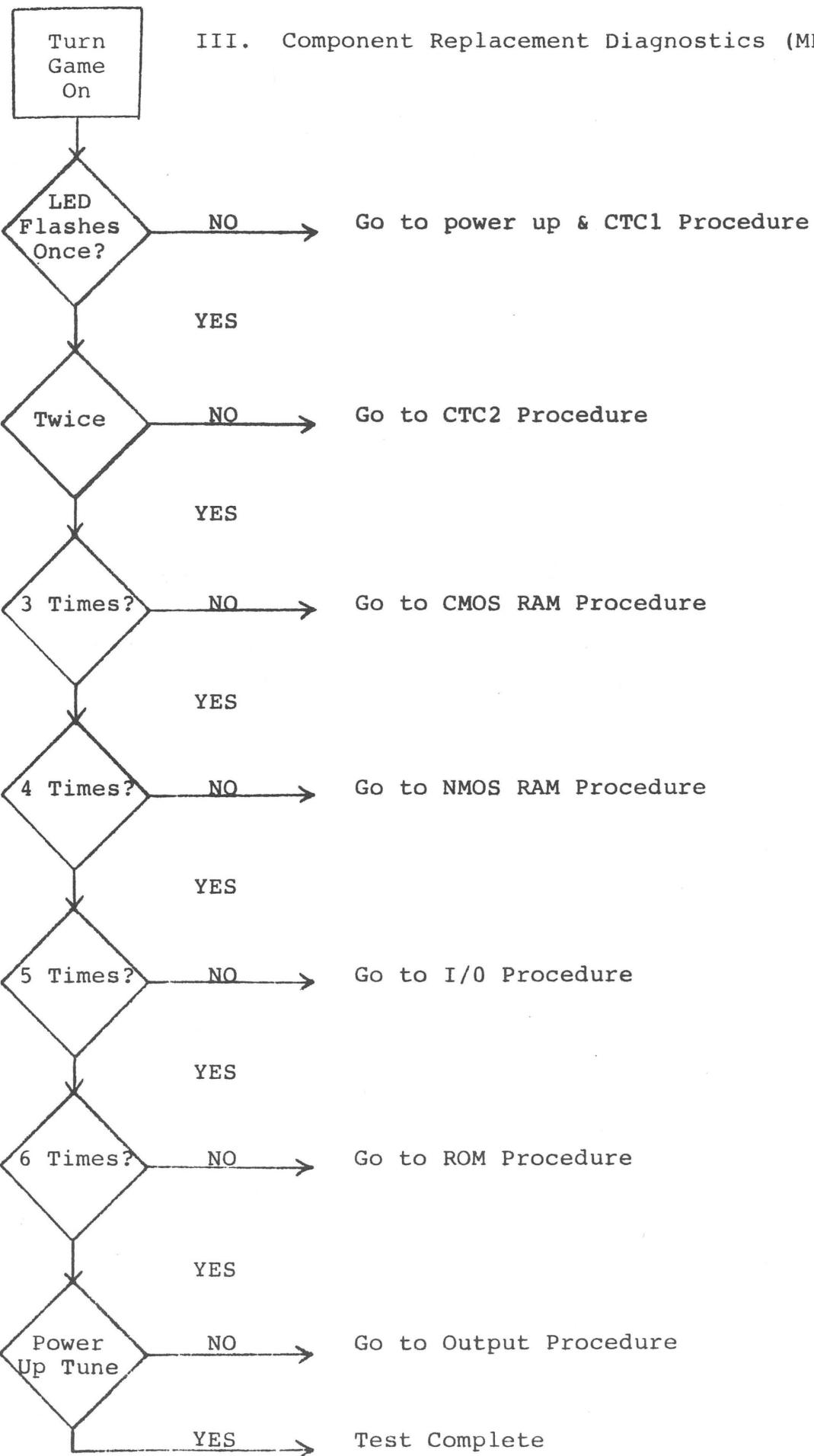
SYMPTOM 10. None of the solenoids operate.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	+24V missing at solenoids	Check +24V at solenoids
If incorrect look for broken wire between +24V at power supply and solenoids and refer to power supply diagnostics.		

	<u>CAUSE</u>	<u>PROCEDURE</u>
B.	+5V missing at solenoid driver board	Check +5 at solenoid driver board. If incorrect look for broken wire between +5V at power supply and solenoid driver board.
C.	Faulty solenoid driver board	Replace solenoid driver Board

SYMPTOM 11. Switch always closed.

	<u>CAUSE</u>	<u>PROCEDURE</u>
A.	Stuck Switch	Locate switch from switch identification table and repair or replace switch.



## COMPONENT REPLACEMENT

### A. Power Up and CTC1 Procedure

---

<u>CAUSE</u>	<u>PROCEDURE</u>
+5V Incorrect	Measure +5V $\pm$ .25V at TP1 of MPU board. If incorrect refer to power supply diagnostics.
+24VDC Incorrect	Measure +24VDC $\pm$ 6V at J1-3 of MPU board. If incorrect refer to power supply diagnostics.
Reset Incorrect	<ol style="list-style-type: none"><li>1. Check for positive reset pulse at pin 35 of U17. If incorrect and negative reset pulse is present at TP4, replace QC. If no negative reset pulse is present at TP4, trace back through QD, QA, QB, U5 and U3 for defect.</li><li>2. Check for negative reset pulse at pin 17 of U10 and pin 26 of U11. If one or both are incorrect and a negative reset pulse is present at TP4, look for open or shorted foil run.</li></ol>

If both are incorrect and no negative reset pulse present at TP4, trace back through QD, QA, QB, U5 and U3 for defect.

D. Oscillator Incorrect Check TP5 for a square wave with a period of about 400ns. If Incorrect trace back through U3 to the crystal.

E. LED Circuit Defective Check for positive pulse at base of QE. If present replace QE. If operation still incorrect replace LED.

F. U10, U11, U17, U6, U7, U8, U12, U13, U26, U24, U25, U4, U3, or U9 defective. Replace one at a time with known good parts until fault is cleared.

#### CTC2 PROCEDURE

---

<u>CAUSE</u>	<u>PROCEDURE</u>
CTC zero cross over input incorrect. Check pin 21 or U10 for positive zero cross over pulse. If incorrect trace back through U3 and U2.	
U10 Defective	Replace U10 with known good I.C.

U3 Defective	Replace U3 with a known good I.C.
U11, U6, U7, U8, U12, U13, U26 or U17 defective	Replace one at a time with known good parts until fault is cleared.

#### C. CMOS RAM Procedure

---

<u>CAUSE</u>	<u>PROCEDURE</u>
CMOS RAM Defective	Replace U6 and U7, one at a time.
CMOS Gate Defective	Replace U9.

#### D. NMOS RAM Procedure

---

<u>CAUSE</u>	<u>PROCEDURE</u>
NMOS RAM Defective	Replace U8
NMOS RAM Chip Select Defective	Replace U5 and U24, one at a Time.

#### E. I/O Procedure

---

<u>CAUSE</u>	<u>PROCEDURE</u>
I/O Defective	Replace U17
I/O chip select gate defective	Replace U4

#### F. ROM Procedure

---

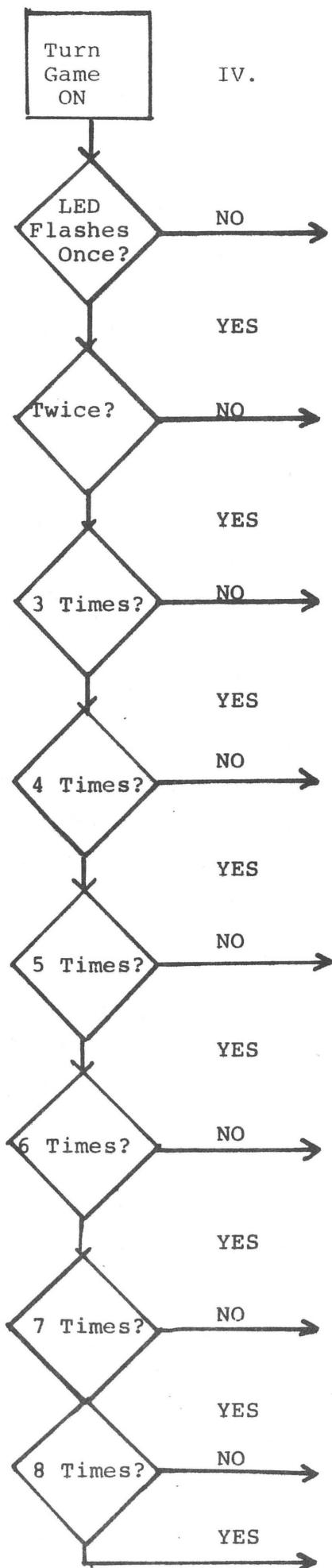
<u>CAUSE</u>	<u>PROCEDURE</u>
ROM Defective	Replace U12, U13 and U26, one at a time

G.

OUTPUT PROCEDURE

---

<u>CAUSE</u>	<u>PROCEDURE</u>
U14, U16, U20, U21, U15, U19, U22, U18 or U23 Defective	Replace on at a time with known good parts.



Component Replacement Diagnostics  
(MSU Board)

Go to Power up & Reset procedure

Go to Power up & Reset procedure

Go to ROM2 procedure

Go to ROM1 procedure

Go to RAM procedure

Go to Interrupt procedure

Go to PIA1 procedure

Go to PIA2 procedure

Test Complete

A. Power Up and Reset Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
+12V Incorrect	Check for +12V $\pm$ 2V At TP4. If incorrect refer to power supply diagnostics.
+5V Incorrect	Check for +5V $\pm$ .25V at TP3. If incorrect refer to power supply diagnostics.
LED Circuit Defective	If LED is out: Ground Pin 8 of U16. If LED does not turn on replace LED. If LED is on: check logic level at Pin 9 of U16. If low replace U16.
Reset Incorrect	Check TP2 for negative going pulses at $\sim$ 10Hz Rate. If pulses present replace U6. If reset still not correct replace U9, then U7. If still incorrect check for shorted data or address lines, If no pulse at TP2 check logic level at Pin 4 of U4. If high replace U8. If low replace U4.
Clock Oscillator Incorrect	Check TP6 For $\sim$ 900Hz Square wave. If not present replace U6. If still not correct replace crystal.

B. ROM2 Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
Defective ROM Chip	Replace U10
Address Decoder Defective	Replace U7

C. ROM 1 Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
Defective ROM Chip	Replace U9
Address Decoder Defective	Replace U7

D. RAM Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
Defective RAM Chip	Replace U8
Address Decoder Defective	Replace U7

E. Interrupt Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
Oscillator Defective	Check for negative going pulses ( 400Hz Rate) at TP5. If no pulses present replace U1.
PIA1 Defective	Check for pulses at Pin 18 of U5. If present replace U5.

F. PIA1 Procedure

<u>CAUSE</u>	<u>PROCEDURE</u>
Improper Input from MPU	Unplug J1 of MSU board. If problem corrected refer to MPU diagnostics.
PIA Defective	Replace U5
Address Decoder Defective	Replace U7

G. PIA 2 Procedure

	<u>CAUSE</u>	<u>PROCEDURE</u>
	PIA Defective Address Decoder Defective	Replace U12 Replace U7
V.	Power Supply Diagnostics	
	CAUTION: The power supply contains dangerous voltage levels. Use extreme caution while troubleshooting.	
	SYMPTOM 1. +5V incorrect, +12V incorrect	
	<u>CAUSE</u>	<u>PROCEDURE</u>
	Defective +5V regulator	Change LM323 with known good.
	SYMPTOM 2. +5V incorrect, +12V incorrect	
	<u>CAUSE</u>	<u>PROCEDURE</u>
	Fuse Blown (+12V)	Replace fuse check 10.5 VAC input to bridge. If correct, replace bridge with known good.
	Defective Bridge	If +5 and +12V still do not come up, replace 11,000 MF Capacitor.
	SYMPTOM 3. +5 and +12V correct +24V incorrect.	
	<u>CAUSE</u>	<u>PROCEDURE</u>
	Fuse Blown (28VAC) on power supply defective bridge.	Replace fuse check 28VAC. If correct replace bridge with known good part.
	Playfield fuse blown	Replace Fuse.
	SYMPTOM 4. +5, +12, +24V correct, +7V incorrect	

<u>CAUSE</u>	<u>PROCEDURE</u>
--------------	------------------

Fuse Blown (8VAC)  
defective bridge

Replace Fuse.  
Check 8 VAC. If correct, replace bridge with known good part.

SYMPTOM 5. AC voltage incorrect on one or more, but not all secondary windings.

<u>CAUSE</u>	<u>PROCEDURE</u>
--------------	------------------

Defective Transformer Winding

Remove fuse from defective secondary. If voltage still incorrect replace transformer. If voltage comes up, disconnect all PC boards that the winding goes to, reinsert fuse and plug PC boards back until defect reappears.

SYMPTOM 6. No secondary AC voltage at transformer, primary voltage correct.

<u>CAUSE</u>	<u>PROCEDURE</u>
--------------	------------------

Defective Transformer

Replace with known good transformer.

## VI. SOLENOID AND SWITCH IDENTIFICATION

### A. TABLE 1.

#### SOLENOID IDENTIFICATION

The solenoid checkout section of the diagnostic routine actuates each solenoid on the playfield. The solenoid number is shown in each display as the solemoid is being actuated. The following list identifies each solenoid by number:

Ball Return.....	01
3 Captive Balls.....	02
Top Thumper.....	03
Middle Thumper.....	04
Bottom Thumper.....	05
Left Targets.....	06
Right Targets.....	07
Left Slingshot.....	08
Right Slingshot.....	09
Not Used .....	10
Not Used.....	11
Not Used.....	12
Not Used.....	13
Flipper Relay Enable.....	14
Feature Lamps On.....	15
Feature Lamps Off.....	16

## SWITCH IDENTIFICATION

B. Table 2

In the switch checout section of the diagnostic routine the number of the closed switch is shown in each display. Closing any switch causes its number to be displayed. The following list identifies each switch by number.

### SWITCH FUNCTION

None Closed.....	00
Accounting Reset.....	01
Credit Button.....	02
Slam Switch.....	03
Spinner.....	04
Coin Chute 2.....	05
Coin Chute 3.....	06
Coin Chute 1.....	07
Tilt Switch.....	08
Left Slingshot.....	09
Right Slingshot.....	10
Ball Return.....	11
H Lane.....	12
U Lane.....	13
N Lane.....	14
Ex/Sp Lane.....	15
3 Captive Balls.....	16
Loop.....	17
Out/Extra.....	18
Left 1000 Pt.....	19
Right 1000 Pt.....	20
Out/Special.....	21
Top Thumper.....	22
Middle Thumper.....	23
Bottom Thumper.....	24
10 Pt. Score Switches.....	25
Diagnostic and Accounting.....	26
A Target.....	27
T Target.....	28
T Target.....	29
I Target.....	30
L Target.....	31
A Target.....	32



GAME PLAN, INC.  
ATTILA PINBALL  
(MODEL 260)

PARTS CATALOG

GAME PLAN INC.  
1515 W. FULLERTON AVE.  
ADDISON ILL. 60101

02-30093A

## INTRODUCTION

THIS PARTS CATALOG HAS BEEN COMPILED TO HELP THE SERVICEMAN IN SELECTING THE PARTS NECESSARY FOR PROPER MAINTENANCE OF GAME PLAN, INC. GAMES.

ALL MOTORS IN NEW GAME PLAN GAMES CARRY A 6 MONTH WARRANTY FROM THE DATE OF PURCHASE OF THE MACHINE. ANY DEFECTIVE MOTOR WILL BE REPLACED FREE OF CHARGE BY YOUR GAME PLAN DISTRIBUTOR.

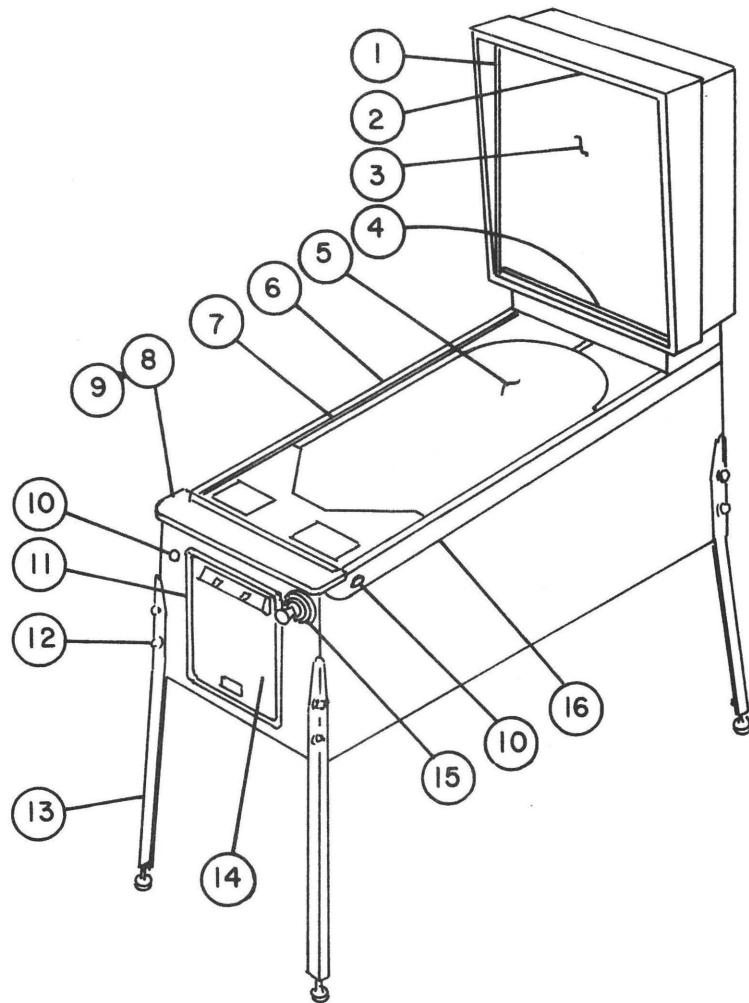
ALL P.C. BOARDS CARRY A 90 DAY WARRANTY. ANY DEFECTIVE P.C. BOARD WILL BE REPAIRED FREE OF CHARGE.

WHEN ORDERING PARTS, ALWAYS SPECIFY THE NAME OF THE UNIT, PART NUMBERS, AND A DESCRIPTION OF THE PART AS SHOWN IN THIS CATALOG.

GAME PLAN, INC.

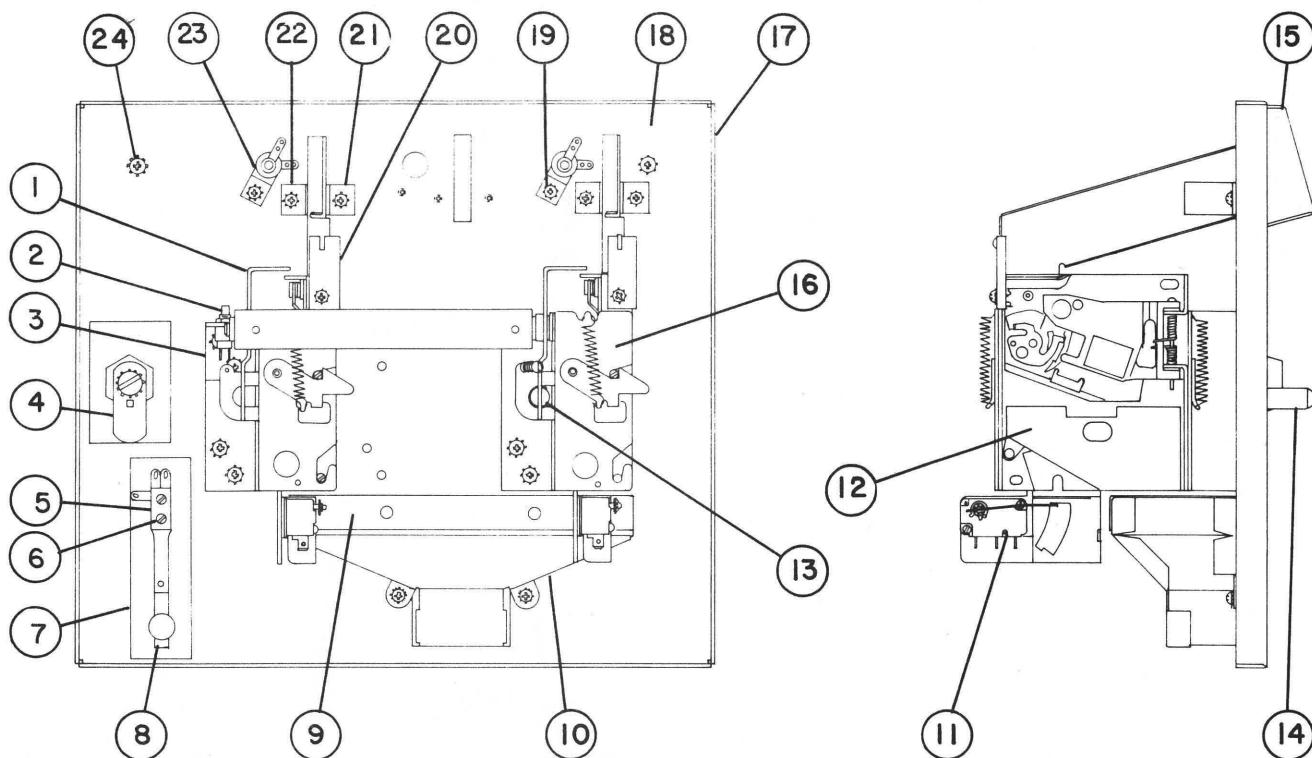
## INDEX

INTRODUCTION.....	1
INDEX.....	2
COMPLETE CABINET.....	3
FRONT DOOR ASS'Y.....	4
BALL SHOOTER ASS'Y.....	5
PLAYFIELD TOP.....	6
PLAYFIELD TOP PARTS LIST.....	7
PLAYFIELD BOTTOM.....	8
PLAYFIELD BOTTOM PARTS LIST.....	9
BANK TARGET ASS'Y.....	10
TILT BLOCK ASS'Y.....	11
FLIPPER BUTTON.....	12
BALL KICKOUT ASS'Y.....	13
POWER SUPPLY ASS'Y.....	14
POWER SUPPLY PARTS LIST.....	15
FLIPPER ASS'Y.....	16
SLING SHOT ASS'Y.....	17
POWER BUMPER ASS'Y.....	18
POWER BUMPER PARTS LIST ASS'Y.....	19
LDU-2 LAMP DRIVER UNIT.....	20
LDU-2 LAMP DRIVER PARTS LIST.....	21
SDU-1 SOLENOID DRIVER UNIT.....	22
SDU-1 SOLENOID DRIVER PARTS LIST.....	23
MPU-2 MICRO PROCESSOR UNIT.....	24
MPU-2 MICRO PROCESSOR UNIT PARTS LIST.....	25
MSU-1 SOUND SIMULATOR UNIT.....	26
MSU-1 SOUND SIMULATOR PARTS LIST.....	27
BDU-1 BACKGLASS DISPLAY UNIT.....	28
BDU-2 BACKGLASS DISPLAY UNIT.....	INSIDE BACK COVER

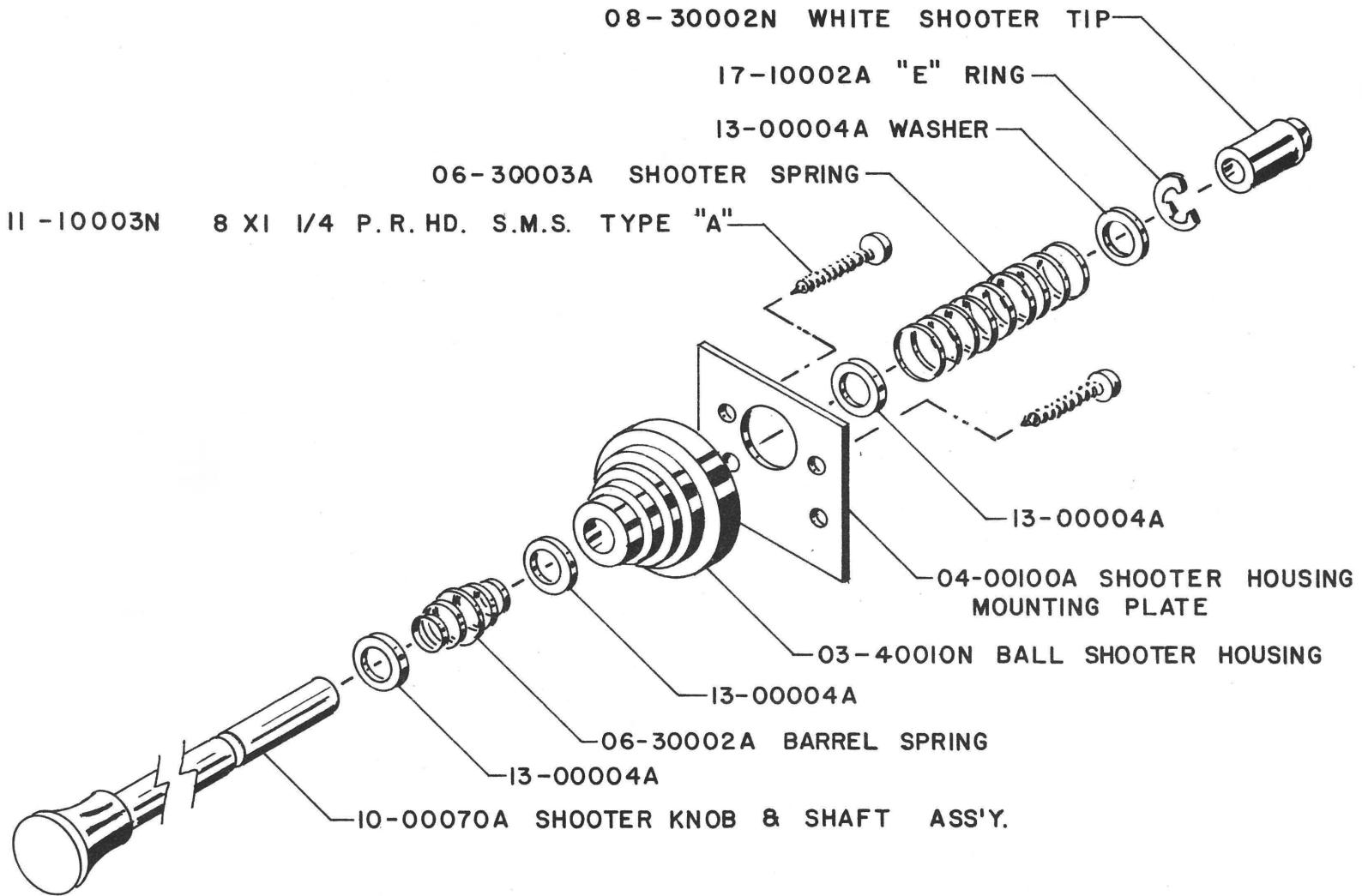


ITEM	PART NO.	DESCRIPTION
1	03-20003A	DISPLAY GLASS CHANNEL (2 SIDES)
2	03-20004A	DISPLAY GLASS CHANNEL (TOP)
3	08-10202E	BACKRACK GLASS
4	04-00163A	GLASS LIFT CHANNEL
5	08-10003D	TOP GLASS
6	04-10004C	SIDE MOLDING-LEFT
7	03-20002A	TOP GLASS CHANNEL
8	10-00057C	FRONT MOLDING ASS'Y.
9	10-10056C	FRONT MOLDING LOCK ASS'Y.
10		FLIPPER BUTTON & CREDIT BUTTON ASSEMBLY (SEE PAGE 12)
11	10-00066C	DOOR FRAME ASS'Y.
12	11-50001N	3/8-16 X 2-3/8 HEX ACORN HD. BOLT
13	04-00156C	CABINET LEG
14	10-10060D	FRONT DOOR ASS'Y. (SEE PAGE 3)
15	10-10074A	BALL SHOOTER ASS'Y. (SEE PAGE 4)
16	04-10005C	SIDE MOLDING - RIGHT

FRONT DOOR ASSEMBLY

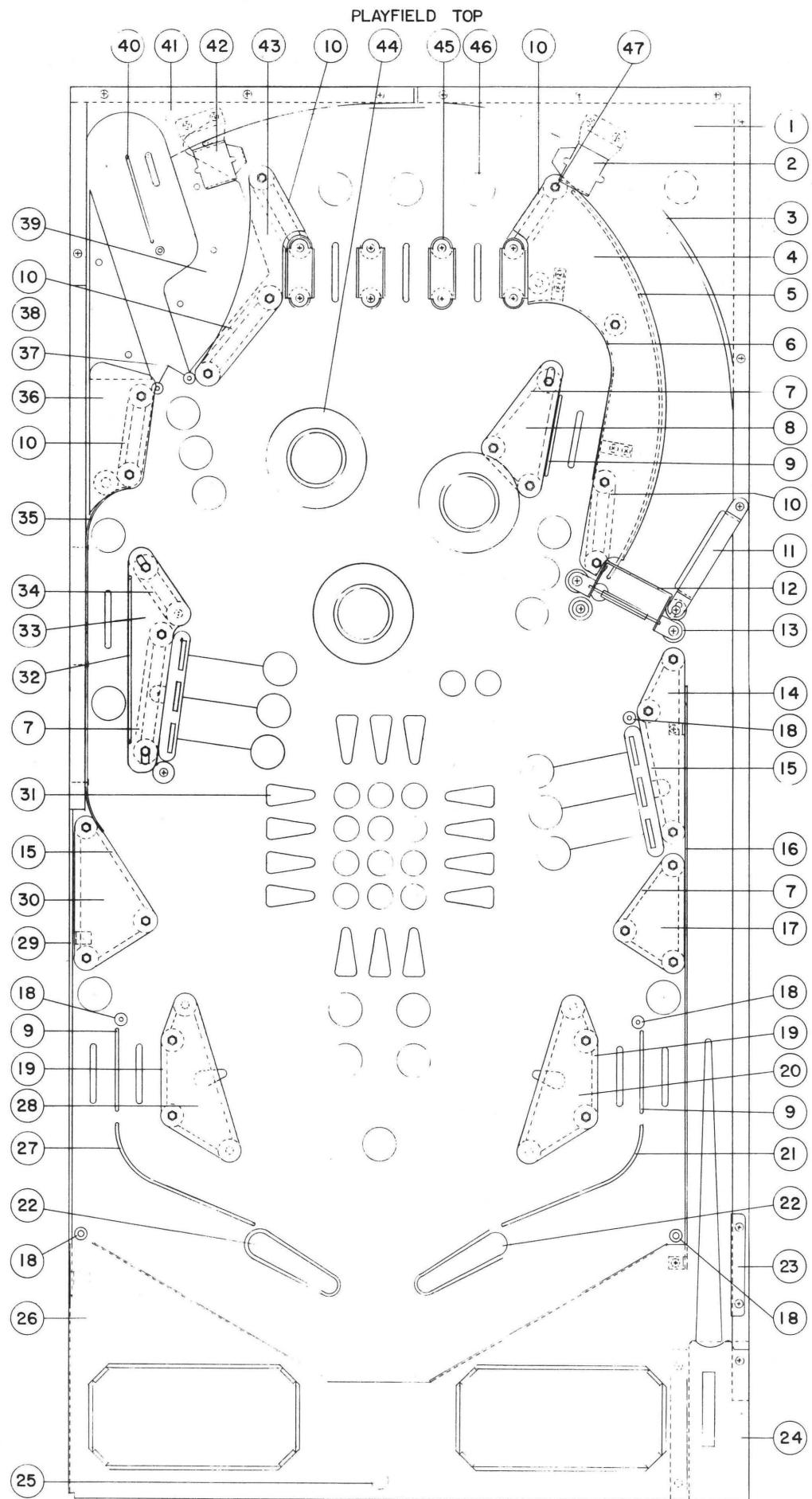


ITEM	PART NO.	DESCRIPTION
1	10-00022A	REJECT ARM ASS'Y.
2	22-1000IN	TEST SWITCH
3	04-00175A	TEST SWITCH MTG. BRACKET
4	14-10002N	LOCK & OFFSET CAM ASSEMBLY
5	17-9000IN	TENSION PLATE
6	11-40028N	5-40 X 1/2 P. R. HD. M. S.
7	08-60009A	TIILT SWITCH INSULATOR
8	22-0001IN	TIILT SWITCH
9	04-00179B	COIN RETURN THROUGH COVER
10	10-00046B	COIN RETURN THROUGH ASS'Y.
11		COIN SWITCH - SPECIFY COIN DENOMINATION
12		COIN ACCEPTOR - SPECIFY COIN DENOMINATION
13	17-10004A	"C" RING
14	05-40004A	REJECT ROD
15	10-10061A	COIN ENTRY FRAME ASS'Y. (SPECIFY COIN & DESCRIPTION ON WINDOW)
16	10-00068B	CHANNEL SUPPORT BRKT. ASS'Y
17	04-00115C	FRONT DOOR
18	10-00050C	FRONT DOOR BACK MTG. PLATE ASS'Y.
19	11-40003N	6-32 X 1/4 P. R. HD. M. S. EXT. SEMS
20	04-00035A	CHUTE ALIGNMENT BRKT.
21	10-00047A	INSIDE COIN TRACK
22	10-00048A	OUTSIDE COIN TRACK
23	29-60006N	SOCKET
	31-00002N	44 LAMP
24	11-40002N	8-32 X 1/4 P. R. HD. M. S. EXT. SEMS



BALL SHOOTER ASSEMBLY

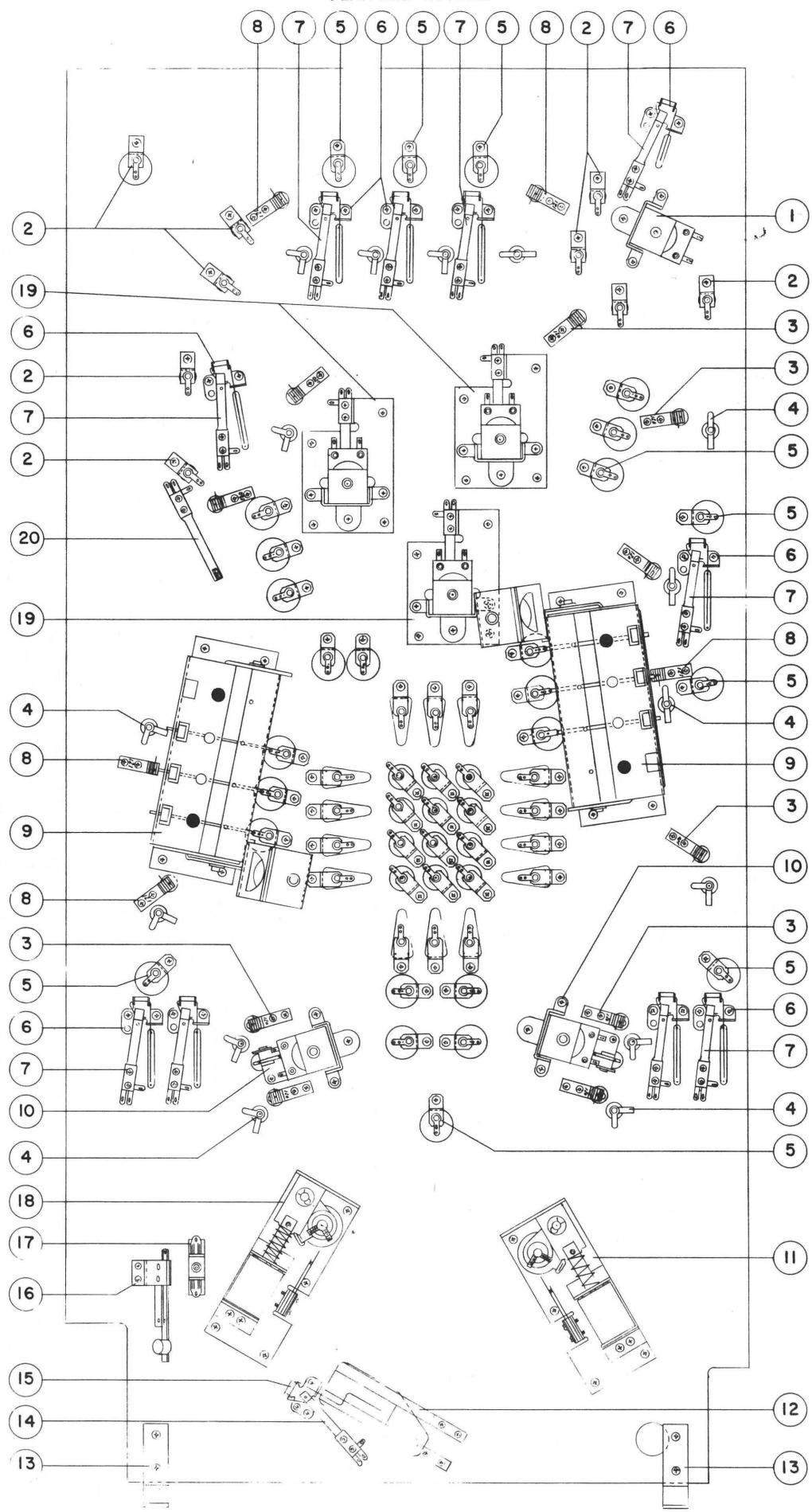
10-10074A



PLAYFIELD TOP

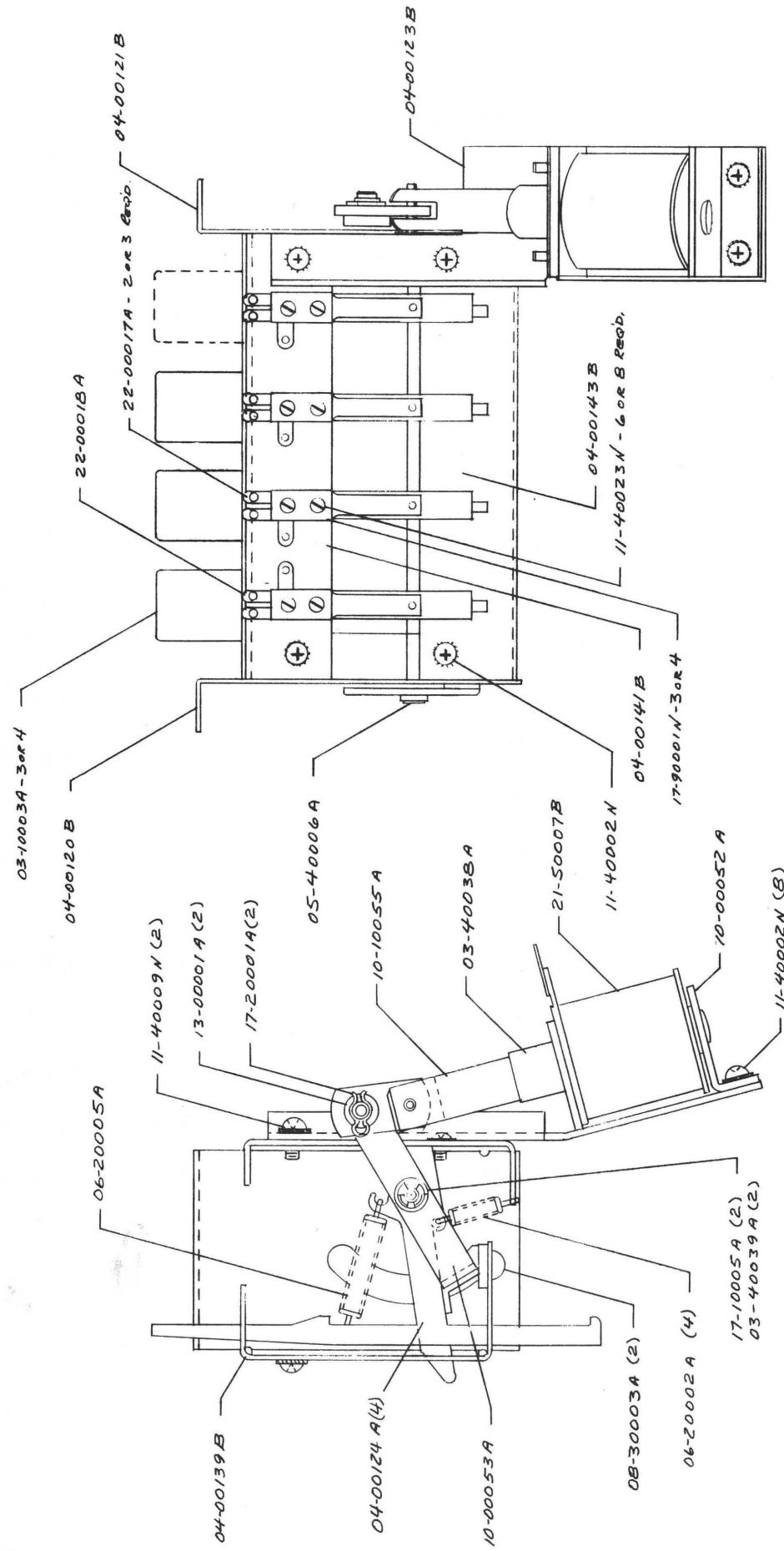
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	08-00123C	Overlay	22	08-30001N	1½ Yellow Flipper Rubber
2	10-00003A	Ball Gate Ass'y	23	04-00101A	Rail Guard
	06-10001B	Spring	24	04-00365N	Shooter Indicator
	05-50001A	Pin	25	08-30003A	Rubber Bumper
3	06-00078C	Ball Run Wire	26	04-00364N	Bottom Arch
4	08-00125C	Overlay	27	06-00030A	Ball Guide Wire
5	06-00027B	Ball Guide Wire	28	08-00132C	Overlay
6	10-10549B	Ball Run	29	10-10544B	Left Side Rail Ass'y
7	08-30012N	2" I.D. Rubber Ring	30	08-00128C	Overlay
8	08-00130C	Overlay	31	03-40079N	1½ Triangle Trans Blue
9	06-00022A	Ball Guide Wire	32	06-00080A	Ball Guide Wire
10	08-30014N	1½" I.D. Rubber Ring	33	08-00127C	Overlay
11	10-10545A	Wire Gate Ass'y	34	08-30006N	1¼" I.D. Rubber Ring
	06-00040A	Wire Gate	35	04-01140B	Ball Run - Long
	04-00358A	Bracket	36	08-00133C	Overlay
12	10-10550N	Spinner Ass'y	37	05-30015A	Mini Post
	10-00014A	Spinner Ass'y	38	08-00135C	Overlay
		Decal	39	08-00134C	Overlay
	04-00016A	Spinner Gate	40	06-00079A	Ball Guide Wire
	06-00013A	Spinner Switch Wire	41	08-00124C	Overlay
	13-40001A	Nylon Washer	42	10-00004A	Ball Rebound Ass'y
13	03-40033N	Post Red	43	08-00136C	Overlay
	08-30004N	5/16" I.D. Rubber Ring	44	03-40080N	Sunburst Cap
14	08-00126C	Overlay	45	03-40042N	1½" Guide Rail
15	08-30009N	2½ I.D. Rubber Ring	46	03-40020N	1" Insert - White
16	10-10543B	Right Side Rail Ass'y	03-40021N	1" " - Red	
17	08-00129C	Overlay	03-40022N	1" " - Yellow	
18	05-30032N	Mini Bumper Post Screw Type	03-40044N	1" " - Amber	
	08-30018N	Mini Post Rubber Ring	03-40045N	1" " - Blue	
19	08-30013N	3" I.D. Rubber Ring	03-40046N	3/4 " - Blue	
20	08-00131C	Overlay	03-40054N	1" " - Green	
21	06-00035A	Ball Guide Wire	47	12-30001N	Acorn Nut

PLAYFIELD BOTTOM



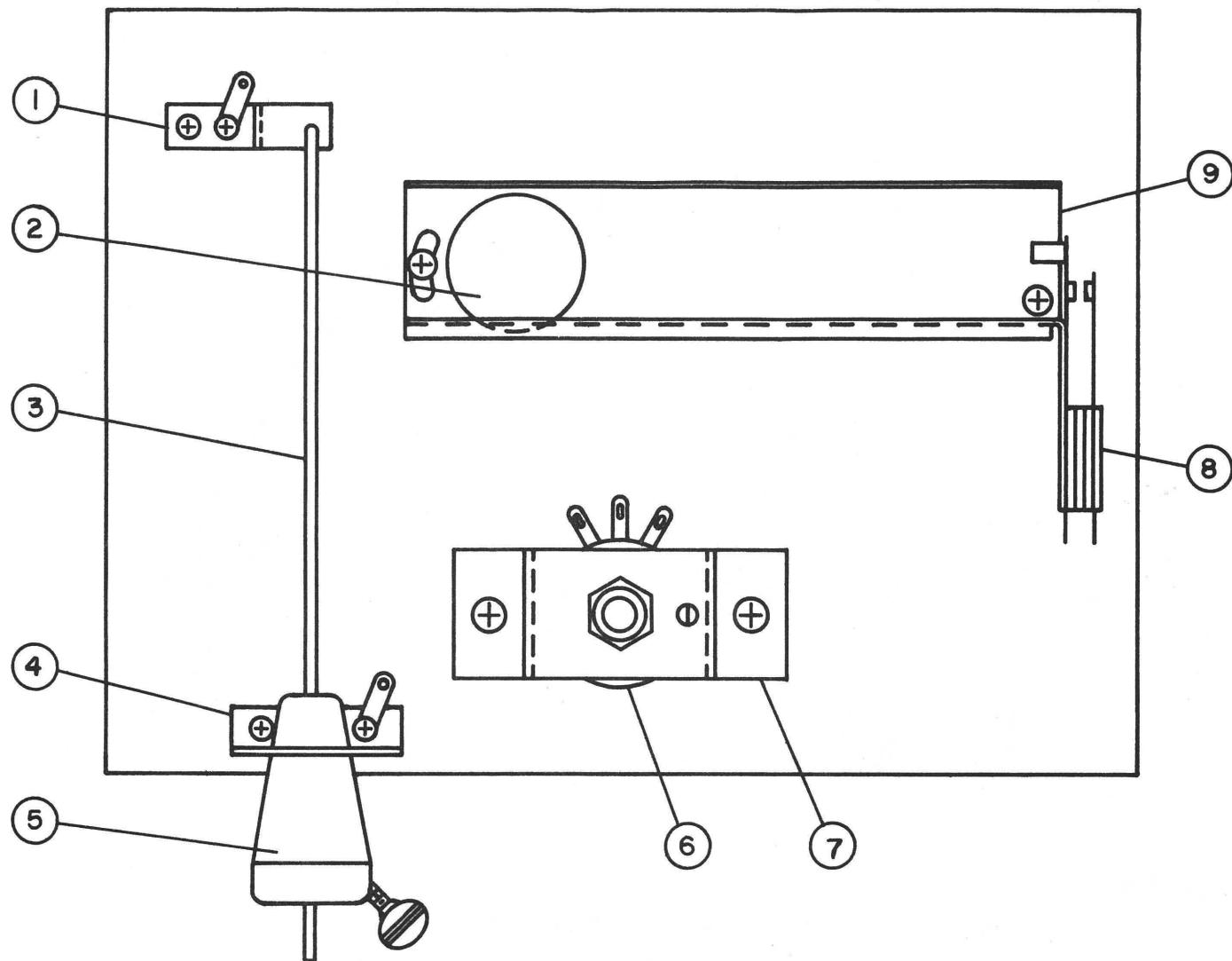
## PLAYFIELD BOTTOM

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	10-10191B	Captive Ball Release Ass'y
2	29-60003N	Min. Lamp Socket-Short Z Brkt.
3	10-00210A	Sling Shot Switch
4	29-60005N	Min. Lamp Socket-Staple Type
5	29-60002N	Min. Lamp Socket-Long Z
6	10-10016A	Rollover Wire Form Ass'y
7	22-00007A	Playfield Switch-Rollover
8	10-00121A	Playfield Switch
9	10-10187N	Drop Target Ass'y.-3 Target
10	10-10009B	Sling Shot Ass'y.
11	10-10081B	Left Flipper Ass'y.
12	10-00051B	Runway Ball Guide Ass'y.
13	04-00136A	Playfield Support Brkt.
14	22-00020A	Ball Kickout Switch
15	10-10017A	Ball Ejector wire form Ass'y.
16	10-00026A	Tilt Switch Ass'y.
17	30-10002N	1 Way Fuse Holder
18	10-10082B	Right Flipper Ass'y
19	10-10004B	Power Bumper Ass'y
20	22-00006A	Spinner Switch



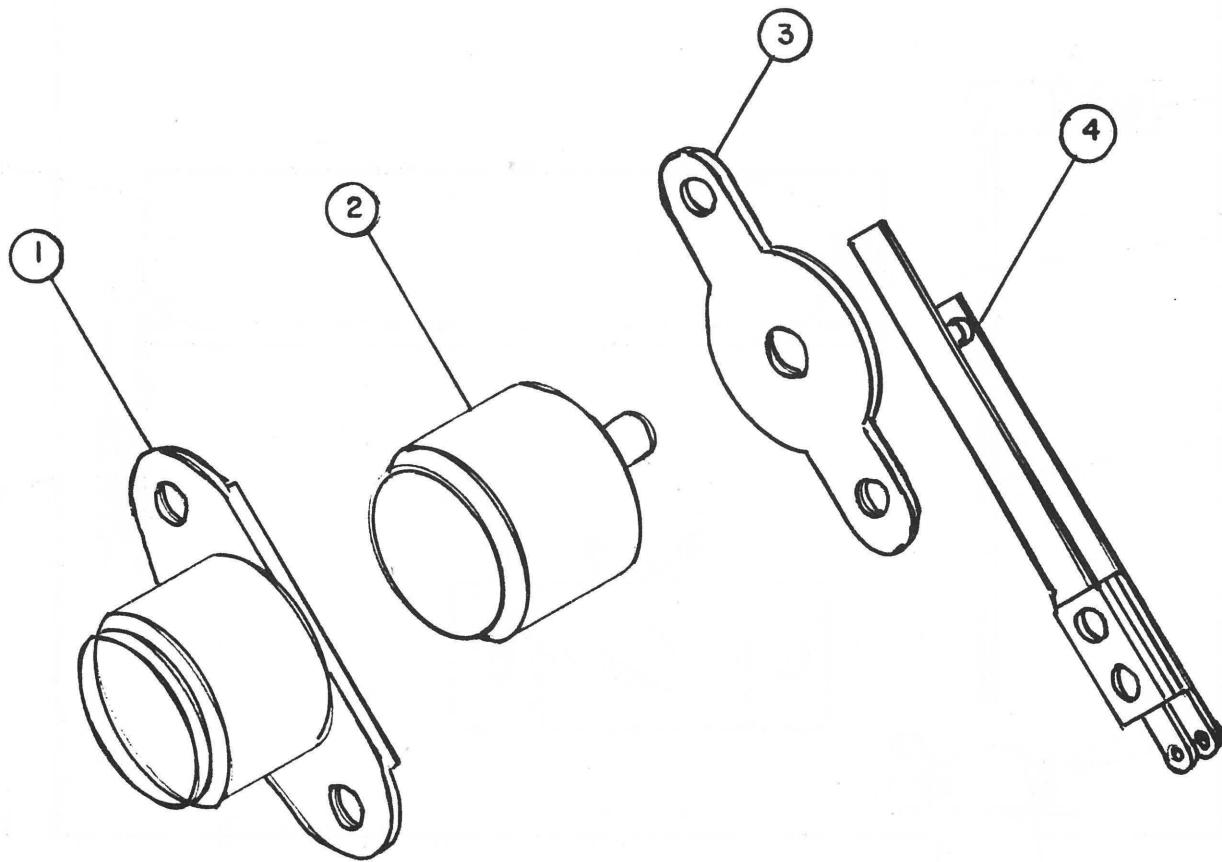
TIILT BLOCK ASSEMBLY

10-10159A



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	04-40002A	TIILT PLUMB BOB HANGER
2	07-40001N	STEEL BALL
3	06-00002A	TIILT PLUMB BOB WIRE
4	04-40001A	TIILT CONTACT PLATE
5	03-10001A	TIILT PLUMB BOB
6	04-00438A	VOLUME CONTROL MTG. BRACKET
7	27-00004N	VOLUME CONTROL
8	22-00003N	SWITCH
9	04-00027B	ROLL TIILT CAGE

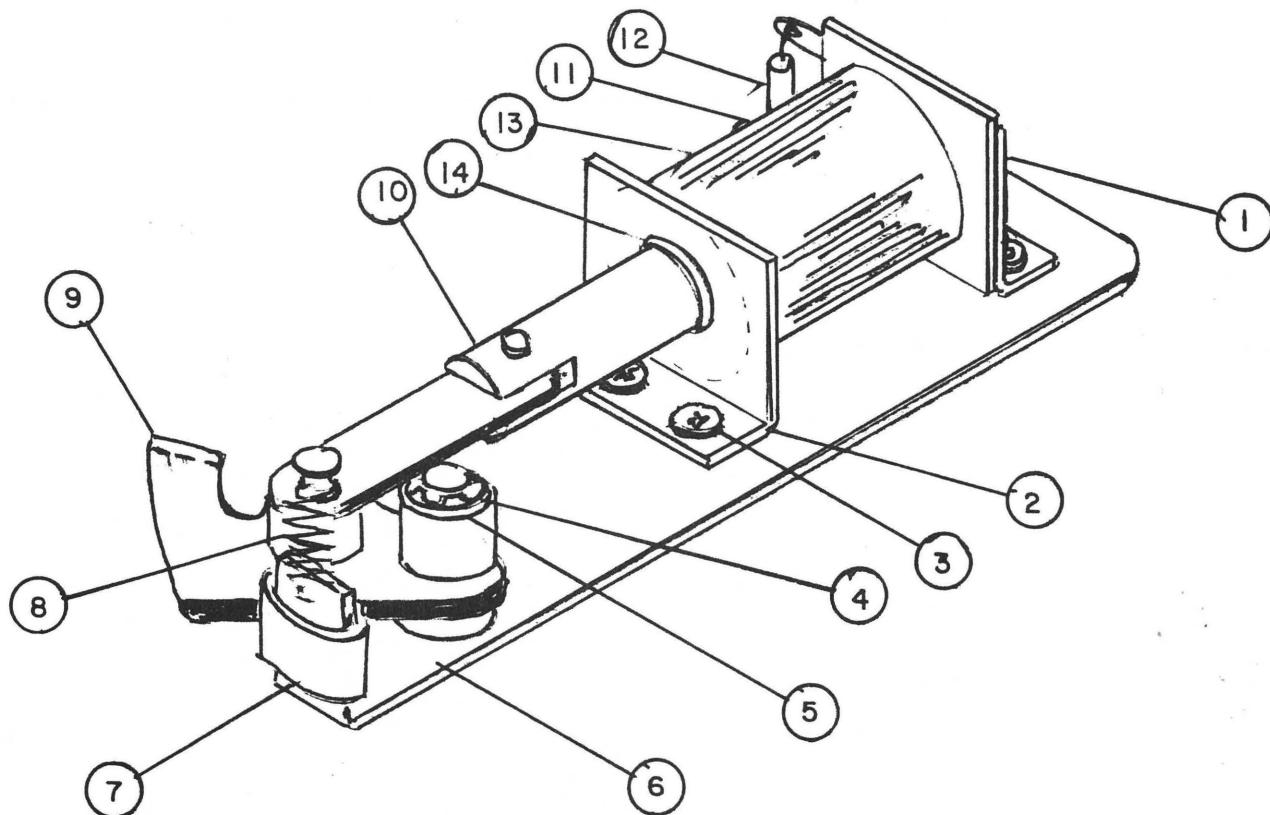
FLIPPER BUTTON



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	
1	03-40014N	FLIPPER BUTTON HOUSING	
2	03-40013N	FLIPPER BUTTON	
3	04-00019A	FLIPPER BUTTON PLATE	
4	22-00009N	FLIPPER SWITCH	
			10-10044

BALL KICKOUT ASSEM.

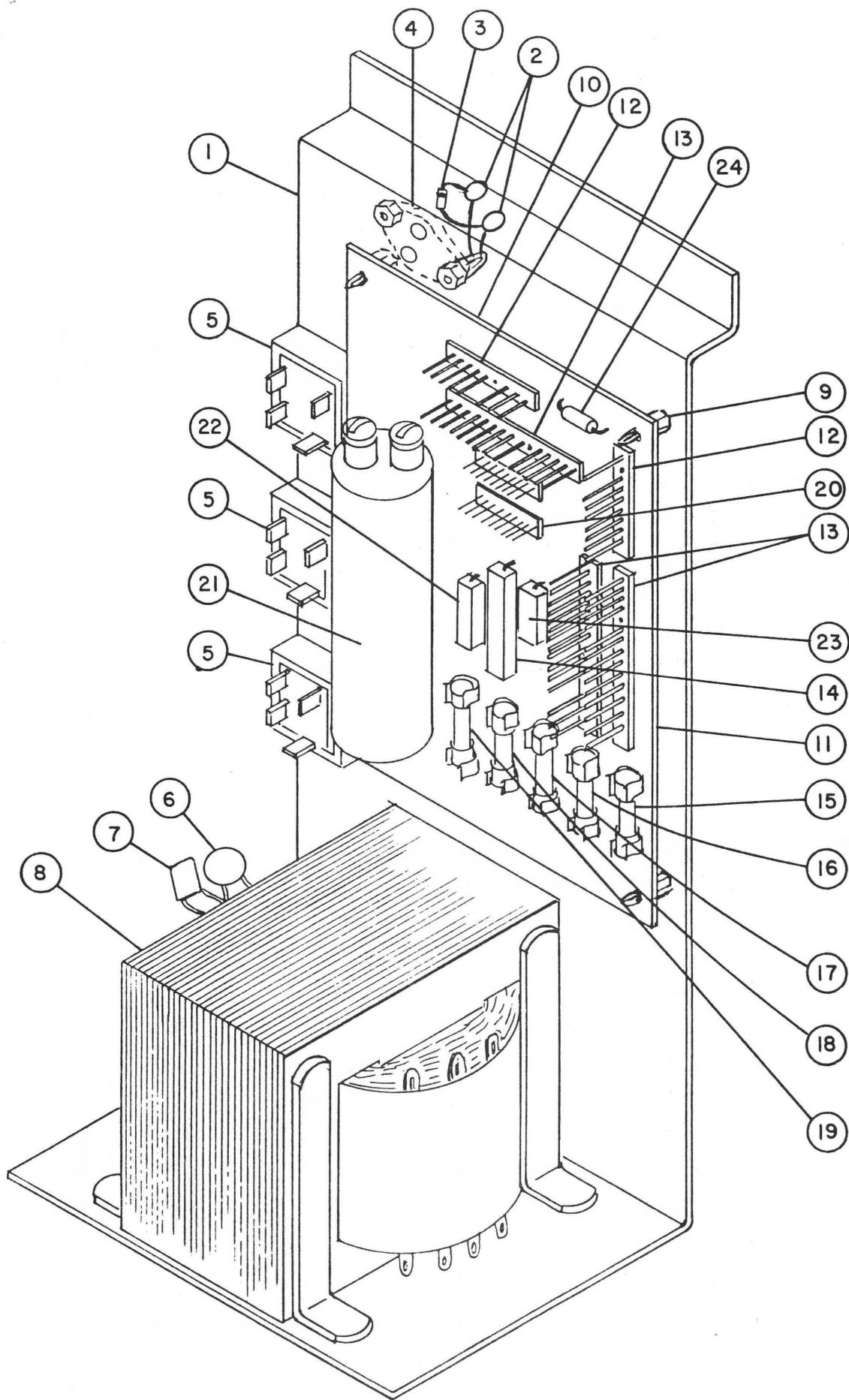
10-10007B



ITEM	PART NO.	DESCRIPTION
1	10-00009A	PLUNGER STOP ASSEM.
2	04-00052A	FRONT COIL STOP
3	11-40003N	6-32 X 1-4 PR.H.M.S. SEMS
4	17-10001A	"E" RING
5	13-00001A	BRASS WASHER
6	10-00001A	MTG. PLATE ASSEM.
7	32-10001A	BALL KICKOUT BUMPER
8	06-20002A	SPRING
9	10-00002A	CAM ARM ASSEM.
10	10-10008A	KICKOUT PLUNGER ASSEM.
11	21-50005B	SOLENOID
12	25-00001N	IN4004 DIODE
13	10-10045N	SOLENOID ASSEM. INCLUDES ITEMS 11,12,14
14	03-40008A	SOLENOID TUBE

PSU-I POWER SUPPLY UNIT

10-10075C

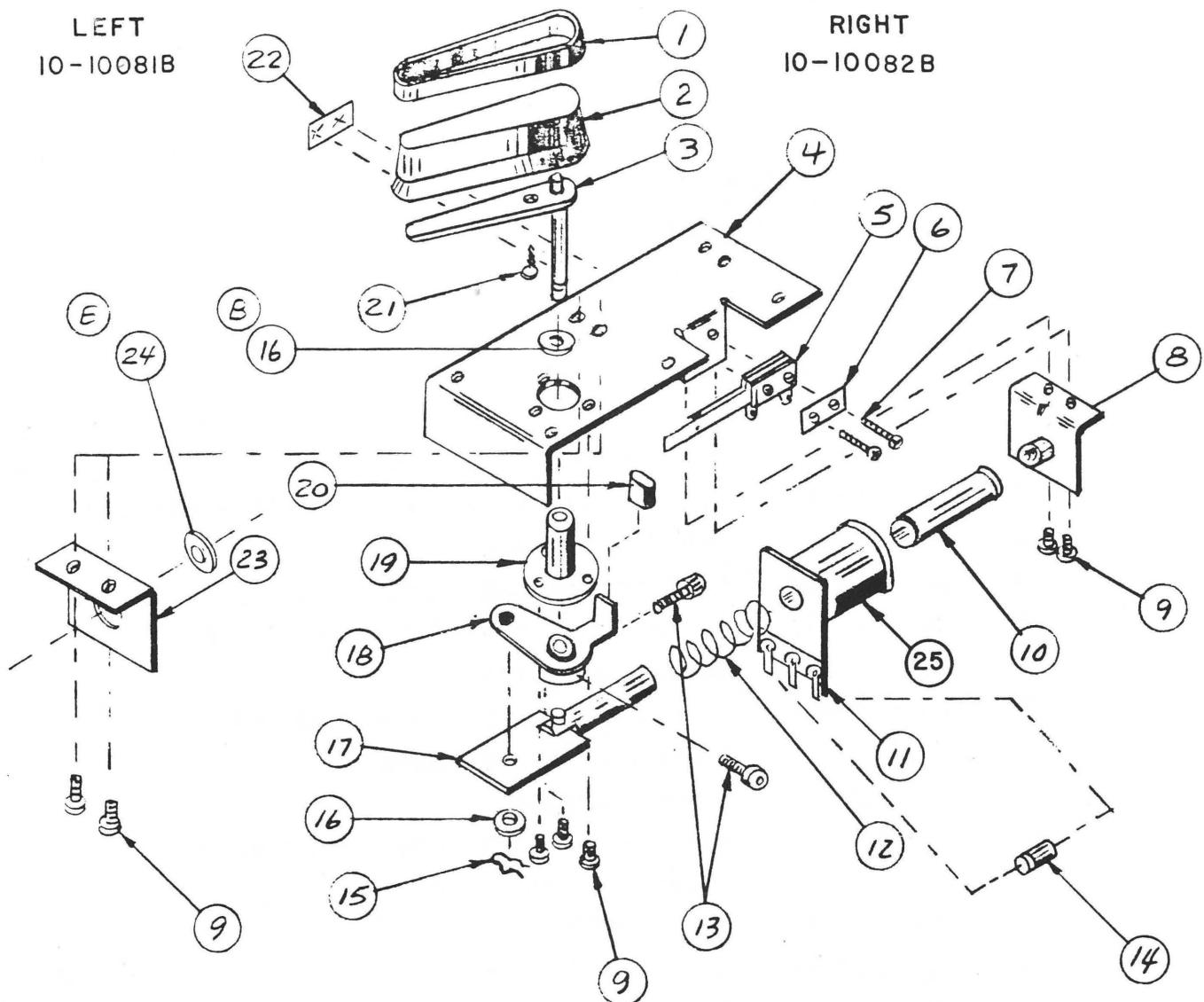


PSU-I POWER SUPPLY UNIT

10-10075C

ITEM	PART NO.	DESCRIPTION
1	04-20020C	PSU MOUNTING BRACKET
2	24-30002N	10 MFD $\pm 10\%$ , 16 V DIPPED TANTALUM CAP
3	25-00001N	IN4004 DIODE
4	26-50001N	LM323K VOLTAGE REGULATOR
5	25-00003N	25 AMP, 200 PIV BRIDGE RECTIFIER
6	25-90002N	50 VAC VARISTOR
7	24-20001N	.1 MFD $\pm 10\%$ , 100 V MYLAR CAP
8	21-30003C	UNIVERSAL TRANSFORMER
9	17-30003N	BOARD SUPPORT
10	20-10013A	PSU-I P.C. BOARD ASS'Y. (INCLUDES ITEMS 11 THRU 24)
11	20-00011B	P.C. BOARD
12	29-00007N	SL-156 HEADER (9 PIN)
13	29-00004N	SL-156 HEADER (15 PIN)
14	23-50001N	5 OHM $\pm 10\%$ , 10 WATT RESISTOR
15	30-00006N	20 AMP, 32 V FUSE
16	30-00004N	10 AMP, 125 V FUSE
17	30-00005N	15 AMP, 32 V FUSE
18	30-00002N	5AMP, 125 V 3 AG FUSE
19	30-00003N	3 AMP, 125 V 3 AG SLO-BLO FUSE
20	29-00001N	CIS HEADER (9 PIN)
21	24-10005N	11,000 MFD, 25 V LYTIC
22	23-40001N	.47 OHM $\pm 10\%$ , 5 WATT RESISTOR
23	23-40002	700 OHM $\pm 10\%$ , 5 WATT RESISTOR
24	23-20002N	100 OHM, $\pm 5\%$ , 1 WATT RESISTOR

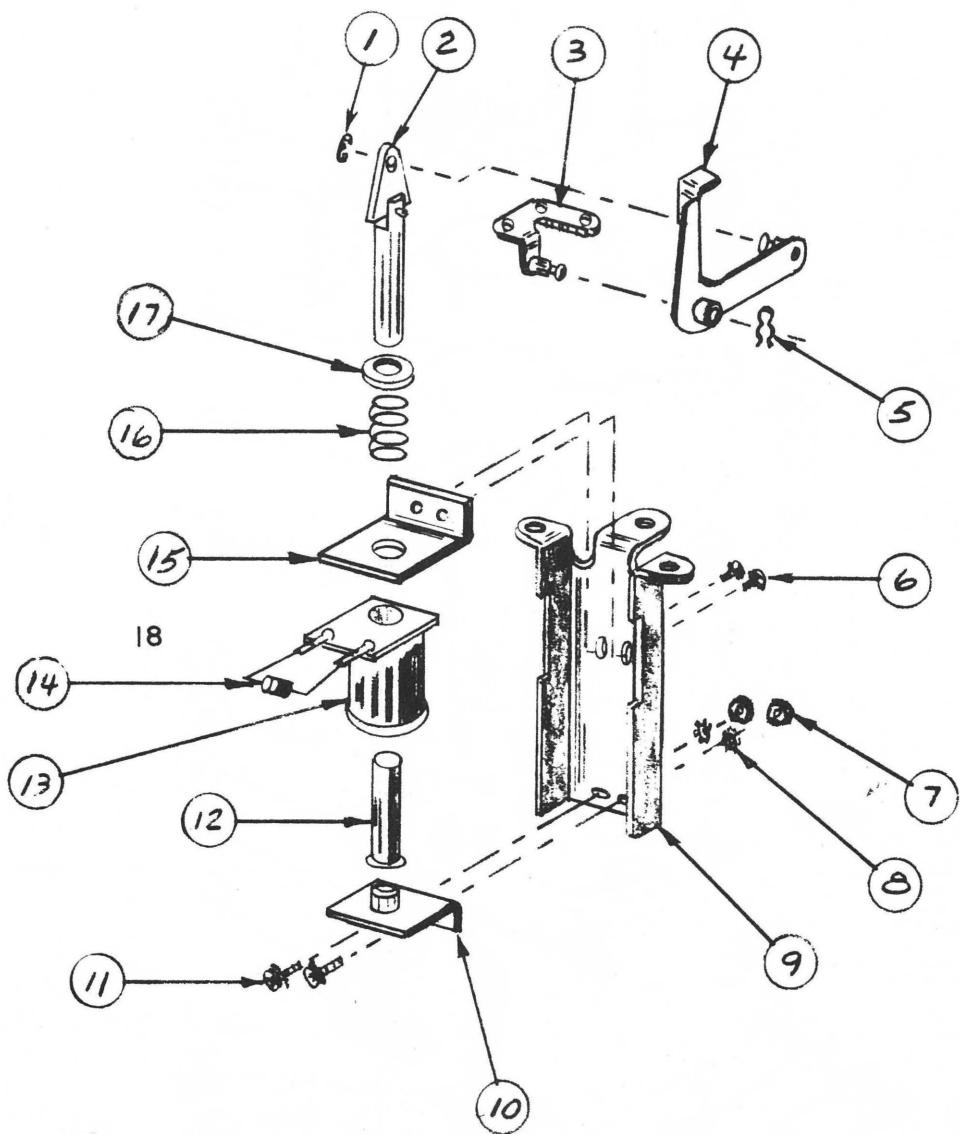
LEFT-RIGHT FLIPPER ASSEM.



ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	08-30001N	FLIPPER RUBBER	13	11-20001N	10/32 SOC.HD.SET SCREW
2	03-40009N	FLIPPER	14	25-00001N	IN 4004 DIODE
3	10-00010A	FLIPPER SHOE ASS'Y	15	17-20001A	SPRING CLIP
* 4	04-00030C	LEFT FLIPPER MTG. PL.	16	13-00001A	BRASS WASHER
5	22-00002N	FLIPPER BREAK SW.	17	10-10002A	FLIPPER PLUNGER ASS'Y
6	17-90001N	TENSION PLATE	18	10-00011A	LEFT FLIPPER ARM ASS'Y
7	11-10019 N	NO.4X5/8S.R.H.S.M.S.TYP'E	"	10-00012A	RIGHT " " "
8	10-00009A	PLUNGER STOP ASS'Y	19	03-40001A	FLIPPER BUSHING
9	11-40003N	6/32XI/4PR.H.M.S.SEMS	20	32-10002A	INSULATOR
10	03-40022N	SOLENOID TUBE	21	11-10002N	6/32XI/2P. TRUSS HD.
11	21-50008B	SOLENOID	22	12-20002N	SPEED NUT
12	06-30004A	PLUNGER RETURN SP.	23	04-00052A	FRONT COIL STOP
* 13	04-00031C	RIGHT FLIPPER PLATE	24	13-00009N	CURVED SPRING WASHER
25 10-10085N SOLENOID ASS'Y. WITH DIODE PLUS ITEMS 10-11					

## SLING SHOT ASSEM.

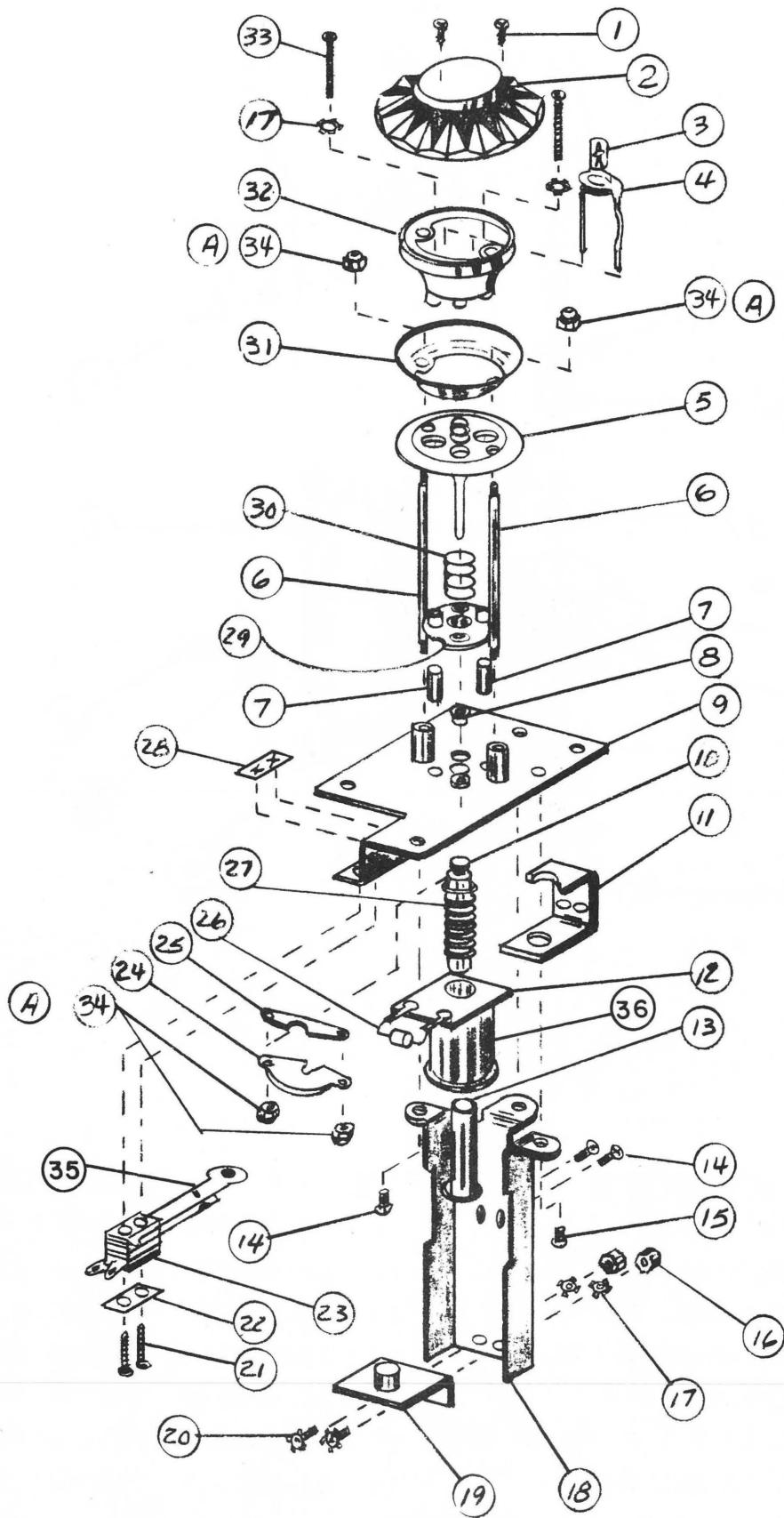
10-10009B



ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	17-10003A	"E" RING	10	10-00009A	PLUNGER STOP BRK'T
2	10-10001A	PLUNGER-LINK ASS'Y	11	11-40004N	6/32 x 3/8 P.R. HD. SEMS
3	10-00005A	ARM MTG. BRK'T ASS'Y	12	03-40008N	SOLENOID TUBE
4	10-00006A	SLING SHOT ARM ASS'Y	13	21-50001B	SOLENOID
5	17-20001A	SPRING CLIP	14	25-00001N	IN4004 DIODE
6	11-40003N	6/32 x 1/4 P.R. HD. SEMS	15	04-00008A	COIL SUPPORT BRK'T
7	12-00002N	6/32 HEX NUT	16	06-30004A	PLUNGER RETURN SPRING
8	13-10002N	NO. 6 EXT. T. LOCKWASHER	17	13-00003A	STEEL WASHER
9	04-00026B	COIL MTG. BRK'T	18	10-10039N	SOLENOID ASS'Y INCL.
					ITEMS 12-12-14

## POWER BUMPER

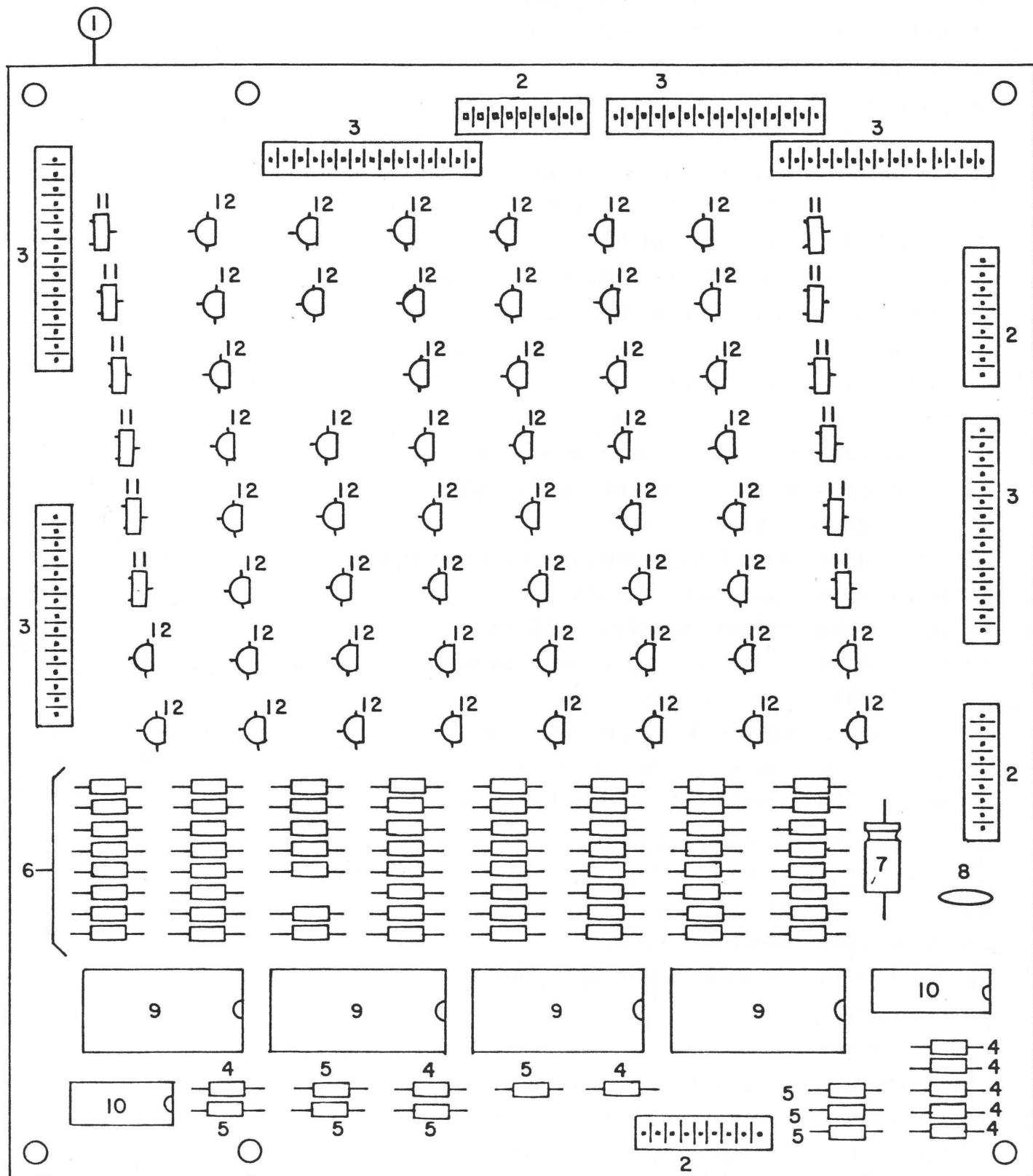
10-10004B



POWER BUMPER ASSEM.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	11-10001N	NO.4X1/2 P.R.HD. S.M.S.
2	03-40003N	SUNBURST CAP
3	31-00002N	NO. 44 LAMP
4	29-60001N	BUMPER LAMP SOCKET
5	03-40005N	WAFER
6	05-40001A	POWER BUMPER ROD
7	32-40002A	" " SPACER
8	32-40003A	SNAP BUSHING
9	10-00008A	BUMPER MTG. PLATE ASS'Y
10	05-70002A	POWER BUMPER PLUNGER
11	04-00011A	" " COIL STOP
12	21-50001B	SOLENOID
13	03-40008N	" TUBE
14	11-40003N	6/32X1/4 P.R.HD. M.S. SEMS
15	11-40002N	8/32X1/4 P.R.HD. M.S. SEMS
16	12-00002N	6/32 HEX NUT
17	13-10002N	NO.6 EXT. TOOTH LOCKWASHER
18	04-00026B	COIL MTG. BRK'T
19	10-00009A	PLUNGER STOP ASS'Y
20	11-40004A	6/32X3/8 P.R.HD. M.S. SEMS
22	17-90001A	TENSION PLATE
23	22-00001N	POWER BUMPER SWITCH
24	04-30003A	FIBER PLUNGER ARM
25	04-10002A	STAINLESS PLUNGER ARM
26	25-00001N	IN 4004 DIODE
27	06-30005A	BUMPER PLUNGER RETURN SPRING
28	12-20002N	SPEED NUT
29	03-40006N	BUMPER BASE
30	06-30001A	POWER BUMPER SPRING
31	04-10001A	" " RING
32	03-40004N	" " BODY
33	11-40001N	6/32 X 1 1/4 P.R.HD. M.S.
34	12-10001N	6/32 ELASTIC STOP NUT
35	03-40007N	BUMPER SWITCH ACTUATOR
36	10-10046N	SOLENOID ASS'Y. INCLUDES ITEMS 12,13,26

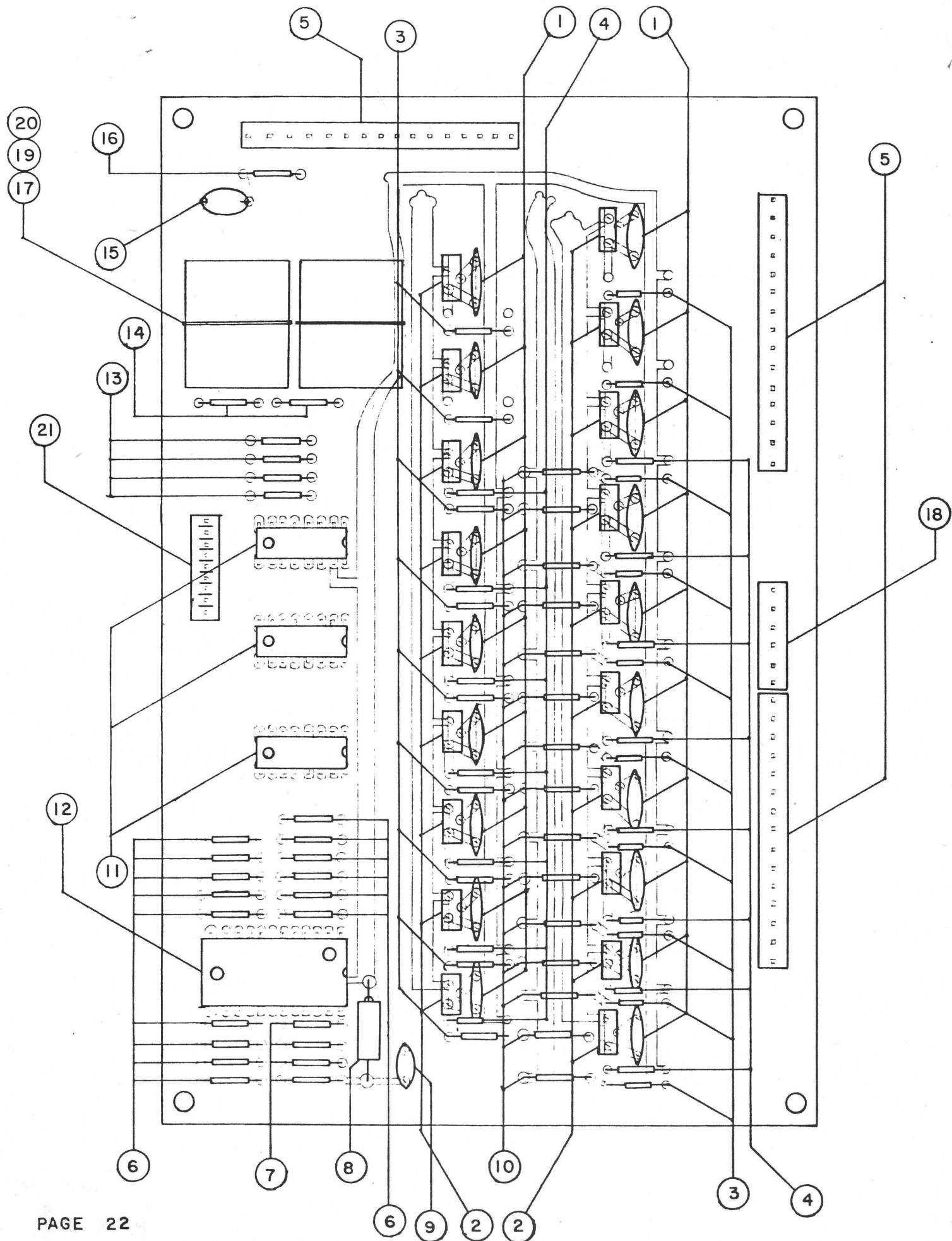
## LDU-2 LAMP DRIVER UNIT



LDU-2 LAMP DRIVER UNIT  
20-10012C

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	20-00010C	LDU-2 P.C. BOARD
2	29-00001N	CIS HEADER (9 PIN)
3	29-00002N	CIS HEADER (15 PIN)
4	23-00009N	2.2 M OHM $\pm$ 5%, 1/4 WATT RESISTOR
5	23-00007N	22 K OHM $\pm$ 5%, 1/4 WATT RESISTOR
6	23-00004N	2.2 K OHM $\pm$ 5%, 1/4 WATT RESISTOR
7	24-10001N	10 MFD, 16 VOLT AXIAL LYTIC CAP
8	24-00001N	.01 MFD $\pm$ 10% CERAMIC DISC CAP
9	26-10001N	4514 INTEGRATED CIRCUIT
10	26-10002N	4050 INTEGRATED CIRCUIT
11	25-20002N	MCR 106-1 SCR
12	25-20001N	2N5060 SCR

S D U - I - SOLENOID DRIVER

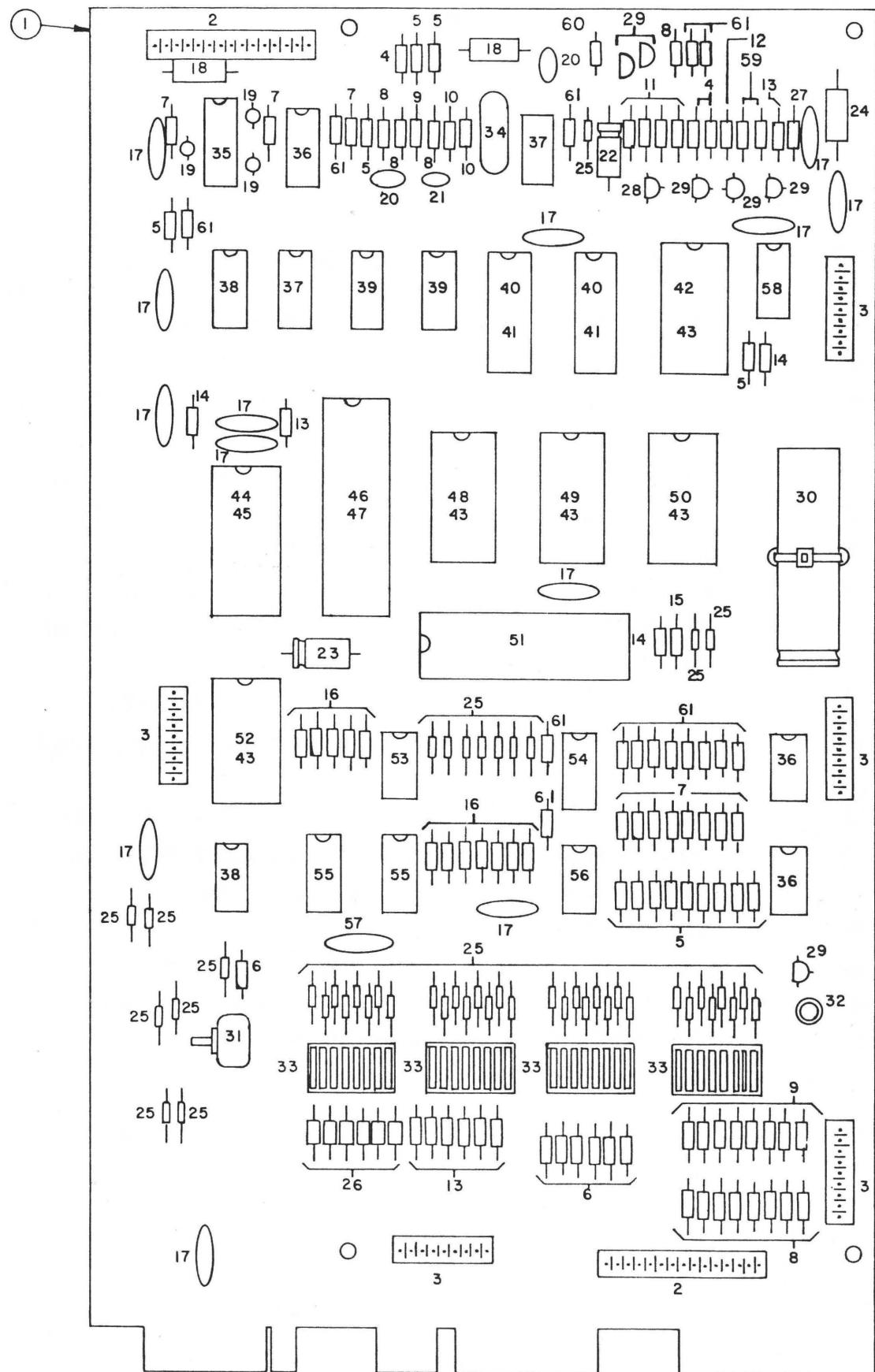


## SDU - I — SOLENOID DRIVER

20-10002B

ITEM	PART NO.	DESCRIPTION
1	24-00002N	.002 mfd. $\pm$ 10%, 1KV. CERAMIC DISC CAP
2	25-10002N	RCA 121 OR SE 9301 TRANSISTOR
3	25-00001N	IN 4004 DIODE
4	23-00002N	330 ohm $\pm$ 5%, 1/4 WATT RESISTOR
5	29-00004N	15 PIN HEADER
6	23-00003N	1.2K ohm $\pm$ 5%, 1/4 WATT RESISTOR
7	23-00008N	100K ohm $\pm$ 5%, 1/4 WATT RESISTOR
8	24-10001N	10 mfd. 16 VOLT AXIAL LYTIC CAP
9	24-00001N	.01 mfd. $\pm$ 10%, 50 VOLT CERAMIC DISC CAP
10	23-10001N	470 ohm $\pm$ 5%, 1/2 WATT RESISTOR
11	26-00005N	CA3081 OR ULN2081 I.C.
12	26-00004N	74154 INTEGRATED CIRCUIT
13	23-00005N	4.7K ohm $\pm$ 5%, 1/4 WATT RESISTOR
14	SEE 3	
15	24-20001N	.1 mfd. $\pm$ 10%, 100 VOLT MYLAR CAP
16	23-00006N	100 ohm $\pm$ 5%, 1/4 WATT RESISTOR
17	21-00001N	4 PDT 24 VDC RELAY
18	29-00003N	6 PIN HEADER
19	29-50001N	RELAY SOCKET
20	06-90001N	RELAY HOLD DOWN SPRING
21	29-00001N	9 PIN HEADER

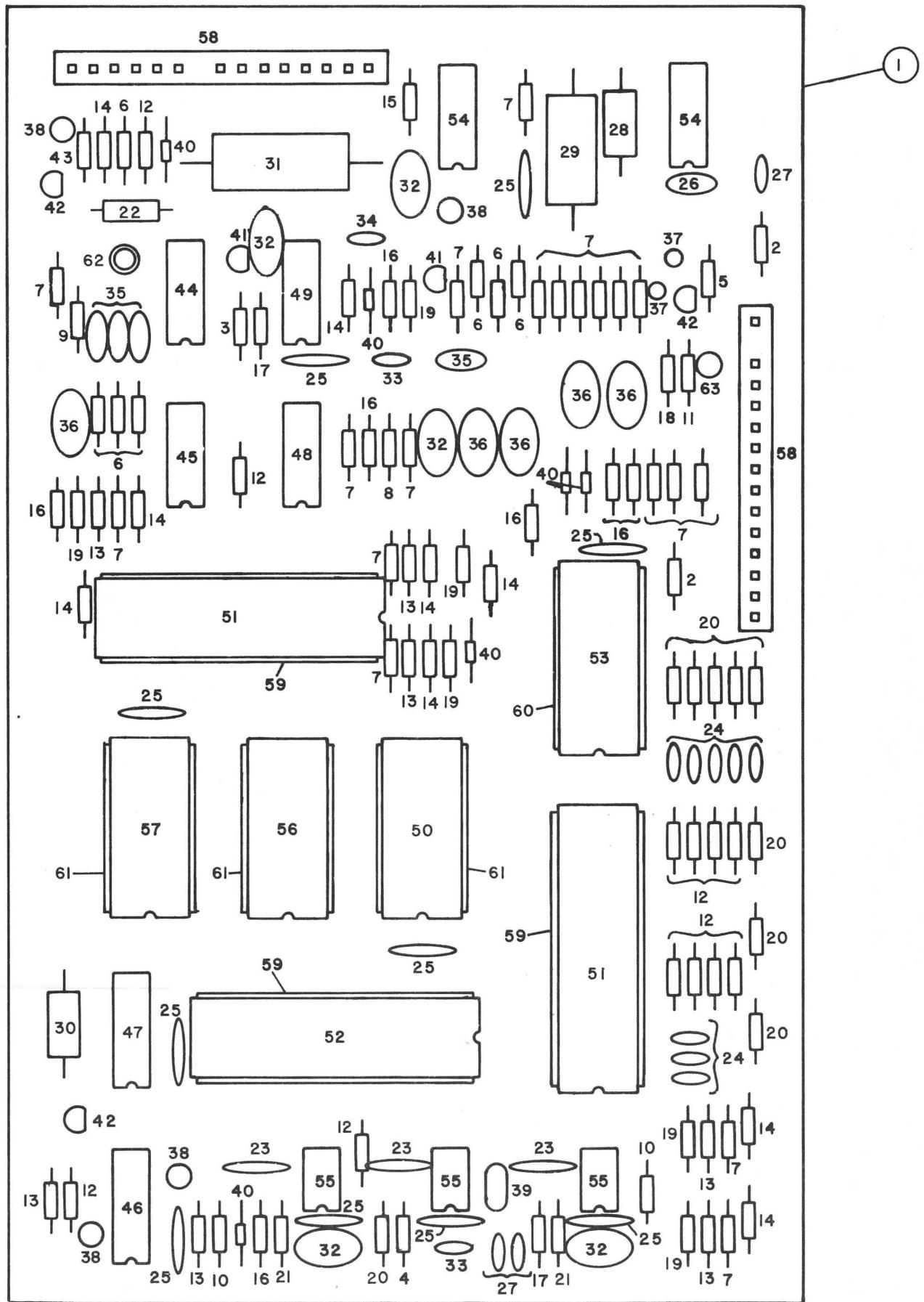
MPU-2 MICRO PROCESSOR UNIT  
20-10016C



MPU-2 MICRO PROCESSOR UNIT

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	20-00029C	MPU-2 P.C. Board	31	22-10003N	Pushbutton Switch
2	29-00002N	15 Pin Header	32	31-10001N	LED
3	29-00001N	9 Pin Header	33	22-50001N	Dip Slide Switch
4	23-00020N	47K OHM $\frac{1}{4}$ W. Res.	34	21-90001N	Crystal (2.4576 MHZ)
5	23-00008N	100K OHM $\frac{1}{4}$ W. Res.	35	26-00011N	74LS123 I.C.
6	23-00006N	100 OHM $\frac{1}{4}$ W. Res.	36	26-60001N	LM339 I.C.
7	23-00016N	220K OHM $\frac{1}{4}$ W. Res.	37	26-00007N	74LS04 I.C.
8	23-00004N	2.2K OHM $\frac{1}{4}$ W. Res.	38	26-00006N	74LS00 I.C.
9	23-00013N	3.3 OHM $\frac{1}{4}$ W. Res.	39	26-00010N	74LS32 I.C.
10	23-00002N	330 OHM $\frac{1}{4}$ W. Res.	40	26-30001N	HM 6551-9 CMOS I.C.
11	23-00007N	22K OHM $\frac{1}{4}$ W. Res.	41	29-50005N	22 Pin I.C. Socket
12	23-00021N	120K OHM $\frac{1}{4}$ W. Res.	42	26-30010N	N Channel RAM, 6810
13	23-00011N	1K OHM $\frac{1}{4}$ W. Res.	43	29-50004N	24 Pin I.C. Socket
14	23-00005N	4.7K OHM $\frac{1}{4}$ W. Res.	44	26-40002N	Z-80 CTC
15	23-00010N	270 OHM $\frac{1}{4}$ W. Res.	45	29-50003N	28 Pin I.C. Socket
16	23-00012N	1.5K OHM $\frac{1}{4}$ W. Res.	46	26-40001N	Z-80 CPU
17	24-00005N	.1 MFD 25V Cer. Cap	47	29-50002N	40 Pin I.C. Socket
18	21-40002N	RF Choke	48	26-30020N	Masked ROM Standard
19	24-30001N	1 MFD 35V Dip. Tan. Cap	49	26-30021N	Model 130 "B" ROM
20	24-00003N	.001 MFD 100V Cer. Cap	50	26-30022N	Model 130 "C" ROM
21	24-00001N	220 PFD 100V Cer. Cap	51	26-40003N	8255 PIA
22	24-10001N	10 MFD, 16V AX. Lytic Cap	52	26-00004N	74154 I.C.
23	24-10004N	22 MFD, 16V AX. Lytic Cap	53	26-00009N	7417 I.C.
24	23-20002N	100 OHM 1 W. Res.	54	26-00012N	74LS138 I.C.
25	25-00002N	1N4148 Diode	55	26-00002N	74LS379 I.C.
26	25-00001N	1N4004 Diode	56	26-00008N	7416 I.C.
27	25-30003N	1N959B Zener Diode	57	24-00001N	.01 MFD 50V Cer. Cap
28	25-10003N	2N4403 Transistor	58	26-10004N	74C32 I.C.
29	25-10004N	2N3904 Transistor	59	23-00019N	8.2K OHM Res.
30	21-90002N	Battery (3.6V N1 CAD)	60	23-00024N	56K OHM Res.
			61	23-00015N	10K OHM Res.

MSU-1  
MICRO SOUND UNIT  
20-10055



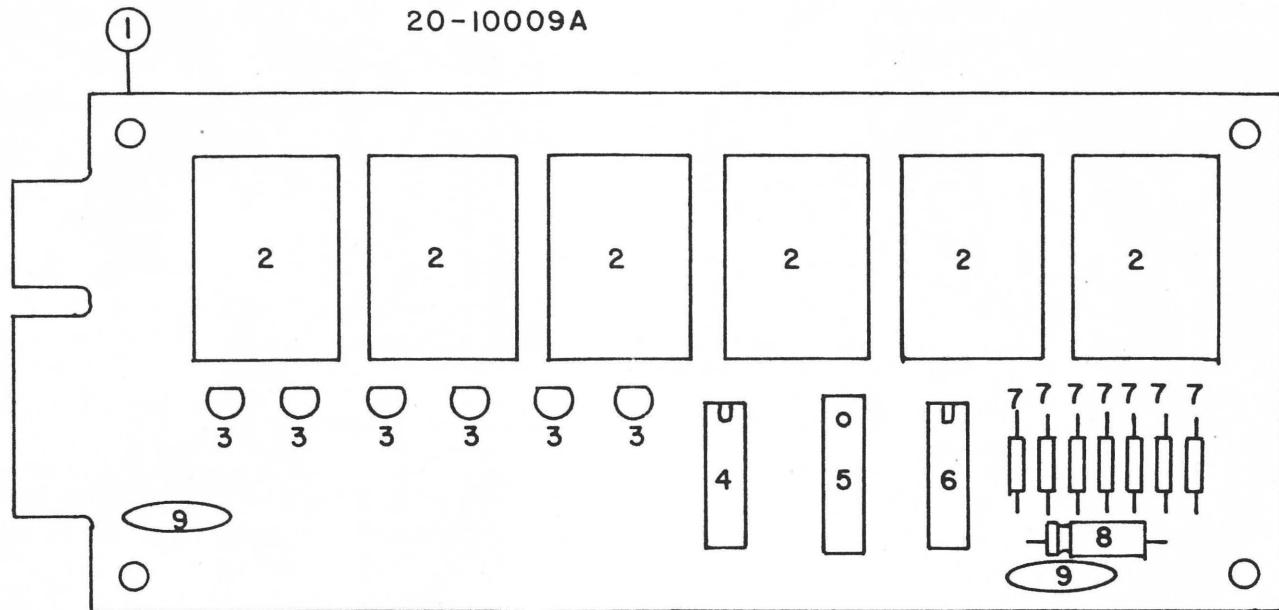
## MICRO SOUND UNIT

20-10055

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	20-00051B	P.C. Board	32	24-20001N	.1 MFD $\pm$ 10%, 100V Mylar Cap
2	23-00011N	1K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	33	24-20003N	.01 MFD $\pm$ 10% 100V Mylar Cap
3	23-00003N	1.2 OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	34	24-20008N	.0047 MFD $\pm$ 10% 100V Mylar Cap
4	23-00004N	2.2K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	35	24-20009N	.047 MFD $\pm$ 10%, 100V Mylar Cap
5	23-00006N	100 OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	36	24-20010N	.22 MFD $\pm$ 10% 100V Mylar Cap
6	23-00007N	22K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	37	24-30001N	1 MFD $\pm$ 10%, 35V Dip.Tan. Cap
7	23-00008N	100K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	38	24-30002N	10 MFD $\pm$ 10%, 16V Dip. Tan. Cap
8	23-00009N	2.2M OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	39	21-90004N	3.579 MHZ Crystal
9	23-00010N	270 OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	40	25-00002N	1N4148 Diode
10	23-00013N	3.3K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	41	25-10003N	2N4403 Transistor
11	23-00014N	6.8K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	42	25-10004N	2N3904 Transistor
12	23-00015N	10K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	43	25-30003N	1N959B Zener Diode
13	23-00016N	220K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	44	26-00008N	7416 I.C.
14	23-00020N	47K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	45	26-00009N	7417 I.C.
15	23-00022N	2.7 OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	46	26-00011N	74LS123 I.C.
16	23-00025N	1M OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	47	26-00012N	74LS138 I.C.
17	23-00026N	27K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	48	26-00027N	7474 I.C.
18	23-00027N	3.3M OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	49	26-00037N	74121 I.C.
19	23-00031N	470K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	50	26-30010N	6810 NMOS RAM
20	23-00035N	470 OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	51	26-40004N	6821 PIA
21	23-00047N	3.9K OHM $\pm$ 5%, $\frac{1}{4}$ W. Res.	52	26-40005N	6808 CPU
22	21-40002N	.22 $\mu$ H 2A RF Choke	53	26-40008N	6840 Counter Timer
23	24-00001N	.01 MFD $\pm$ 10%, 50V Cer. Cap	54	26-60003N	LM380 I.C.
24	24-00004N	680 PF $\pm$ 10%, 100V Cer. Cap	55	26-60004N	555 I.C.
25	24-00005N	.1 MFD $\pm$ $\frac{80}{20}$ %, 25V Cer. Cap	56	26-3C183N	System ROM
26	24-00003N	.001 MFD $\pm$ 10%, 100V Cer. Cap	57	26-30184N	<b>Sharp</b> Sound User EPROM
27	24-00016N	39 PF $\pm$ 10%, 50V Cer. Cap	58	29-00004N	AMP SL-156 15 Pin Header
28	24-10001N	10 MFD, 16V AX. Lytic Cap	59	29-50002N	40 Pin I.C. Socket
29	24-10003N	150 MFD, 25V AX. Lytic Cap	60	29-50003N	28 Pin I.C. Socket
30	24-10004N	22 MFD 16V AX. Lytic Cap	61	29-50004N	24 Pin I.C. Socket
31	24-10006N	250 MFD, 15V NP Lytic Cap	62	31-10001N	LED
			63	24-30003N	22 MFD $\pm$ 10%, 10V Dip. Tan.

BDU-1 BACKGLASS DISPLAY UNIT

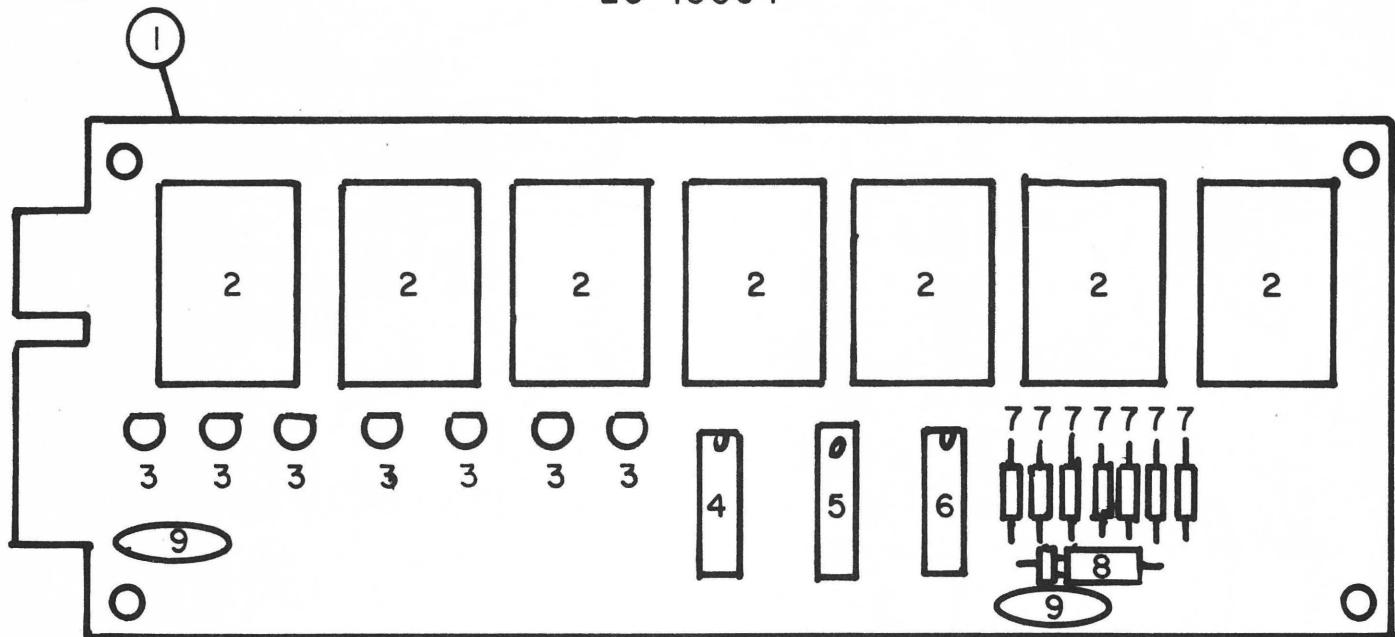
20-10009A



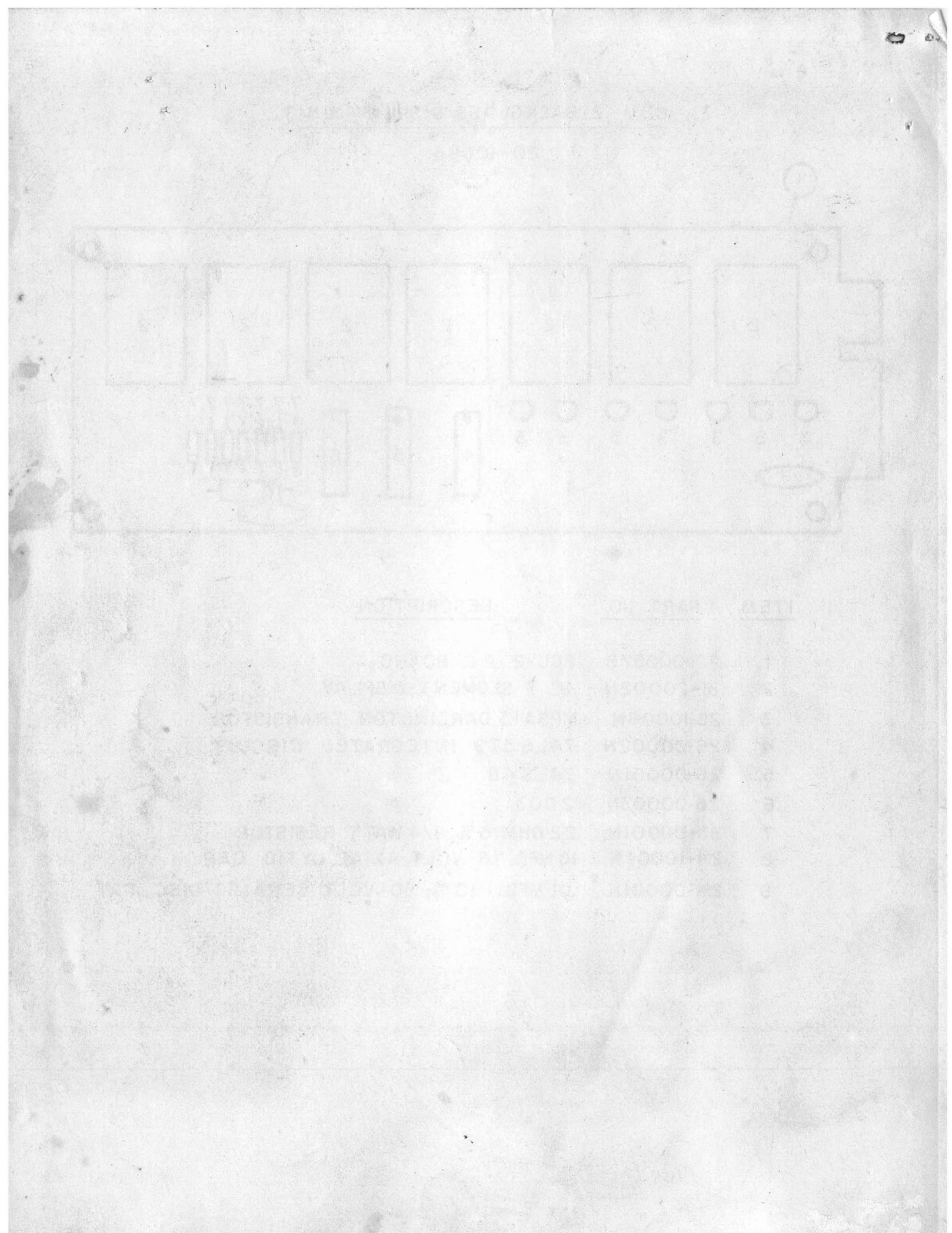
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	20-00008B	BDU-1 P.C. BOARD
2	31-20002N	.8" 7 SEGMENT DISPLAY
3	25-10006N	MPSA13 DARLINGTON TRANSISTOR
4	26-00002N	74LS379 INTEGRATED CIRCUIT
5	26-00001N	74LS48 INTEGRATED CIRCUIT
6	26-00003N	2003 INTEGRATED CIRCUIT
7	23-00001N	22 OHM $\pm$ 5%, 1/4 WATT RESISTOR
8	24-10001N	10 MFD, 16 VOLT AXIAL LYTIC CAP
9	24-00001N	.01 MFD $\pm$ 10%, 50 VOLT CERAMIC DISC CAP

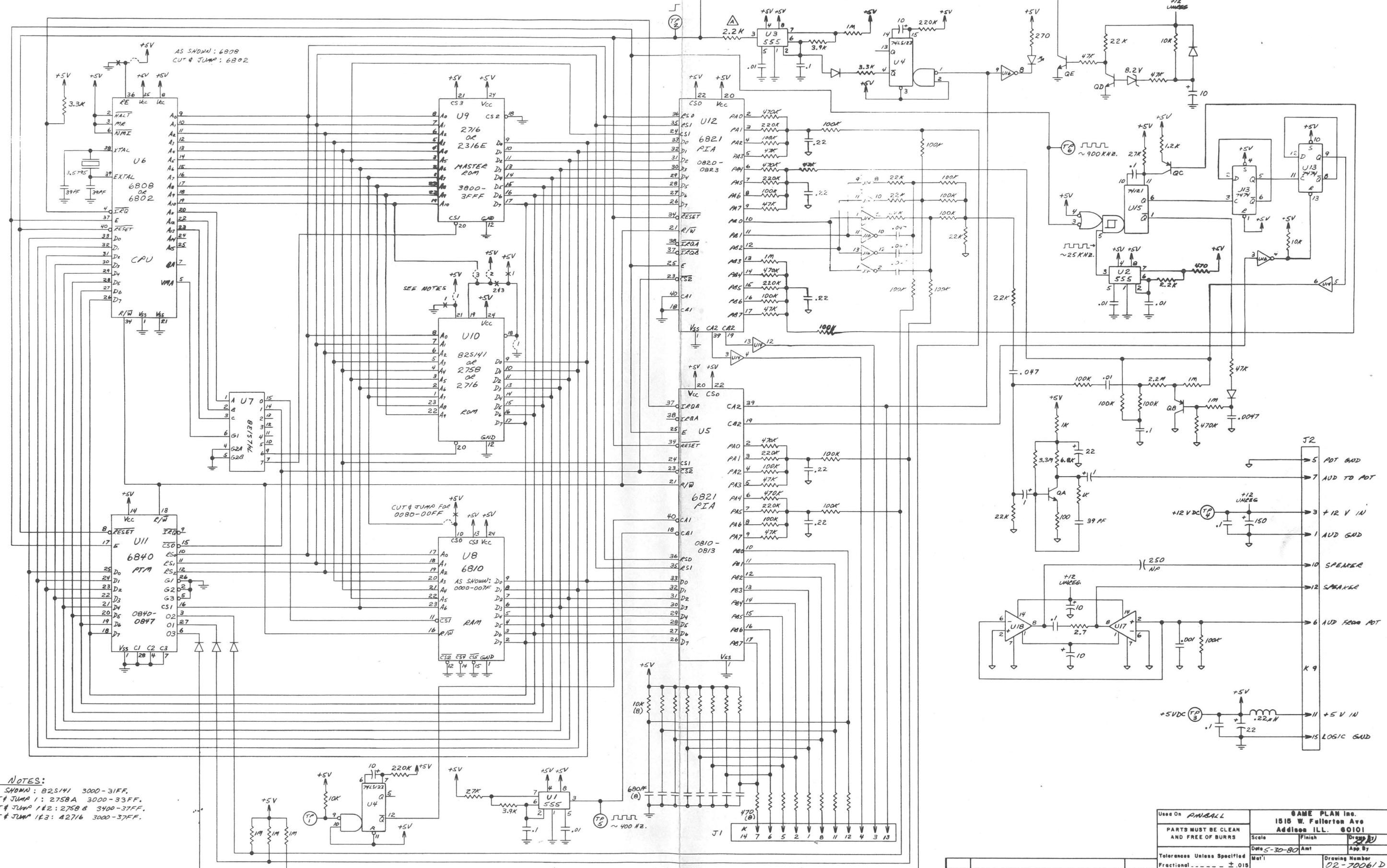
## BDU-2 BACKGLASS DISPLAY UNIT

20-10064



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1.	20-00057B	BDU-2 P.C. BOARD
2	31-20002N	.8" 7 SEGMENT DISPLAY
3	25-10006N	MPSA13 DARLINGTON TRANSISTOR
4	26-00002N	74LS379 INTEGRATED CIRCUIT
5	26-00001N	74LS 48 " "
6	26-00003N	2003 " "
7	23-00001N	22 OHM 5%, 1/4 WATT RESISTOR
8	24-10001N	10 MFD, 16 VOLT AXIAL LYTIC CAP.
9	24-00001N	.01 MFD 10%, 50 VOLT CERAMIC DISC CAP.

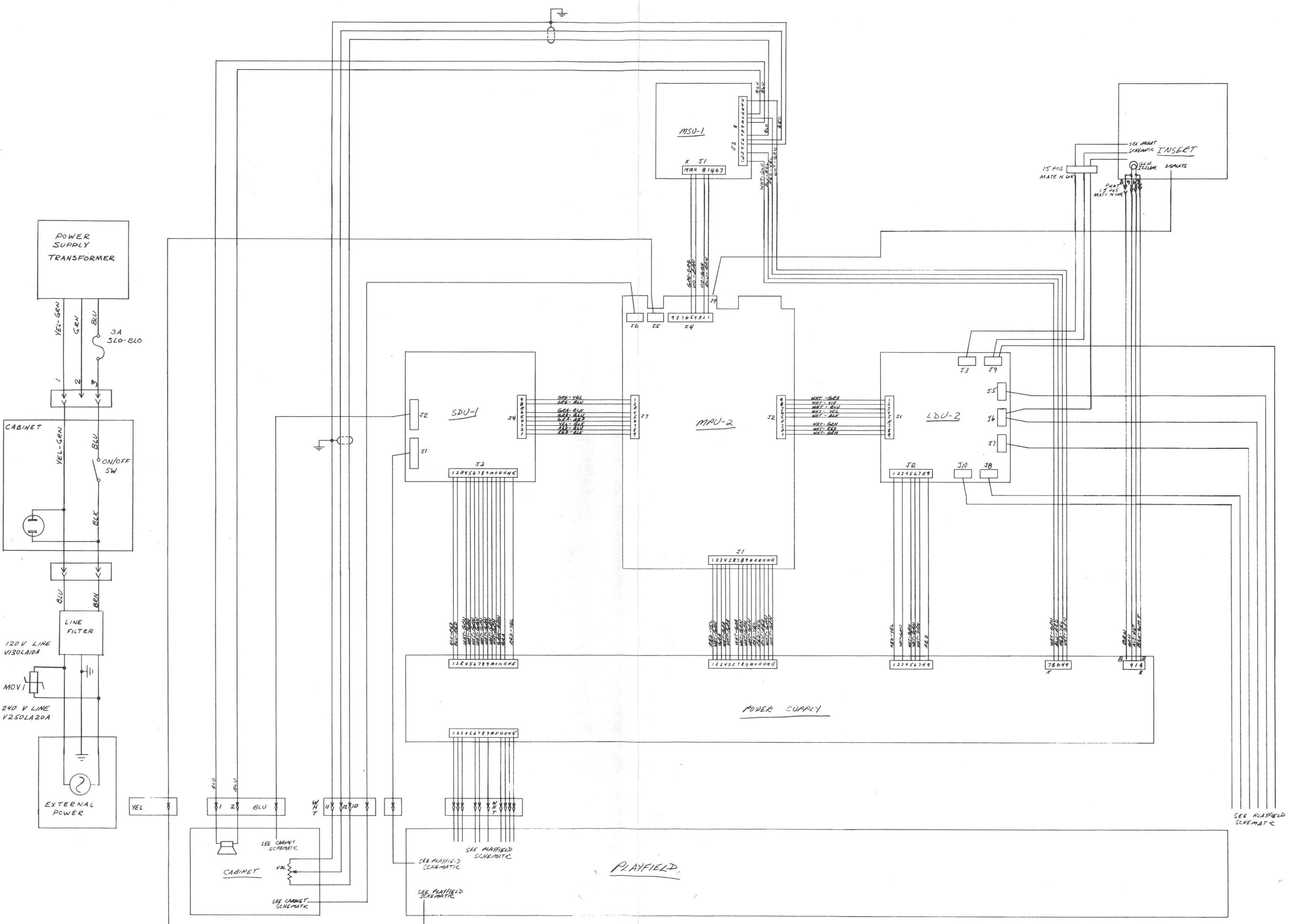




## UIO NOTES:

AS SHOWN: 82S141 3000-31FF.  
CUT # JUMP 1: 2758A 3000-33F  
CUT # JUMP 1#2: 2758B 3400-37F  
CUT # JUMP 1#3: 82716 3000-37F

Used On <u>PINBALL</u>		NAME <u>PLAN Inc.</u>	
		1515 W. Fullerton Ave	
		Address <u>ILL. 60101</u>	
PARTS MUST BE CLEAN AND FREE OF BURRS		Scale	Finish
		Date <u>5-30-80</u>	Am't
		App By	
Tolerances Unless Specified		Mat'l	Drawing Number
Fractional ----- $\pm$ .015		<u>02-70061D</u>	
Decimal ----- $\pm$ .005			
Angles ----- $\pm$ 1/2			
Screw Threads ----- Class 2		<u>MSU-1 SCHEMATIC</u>	
<u>A</u>	<u>WAS 10K</u>	<u>6-24-80</u>	
<u>ISSUE</u>	<u>CHANGE</u>	<u>DATE</u>	



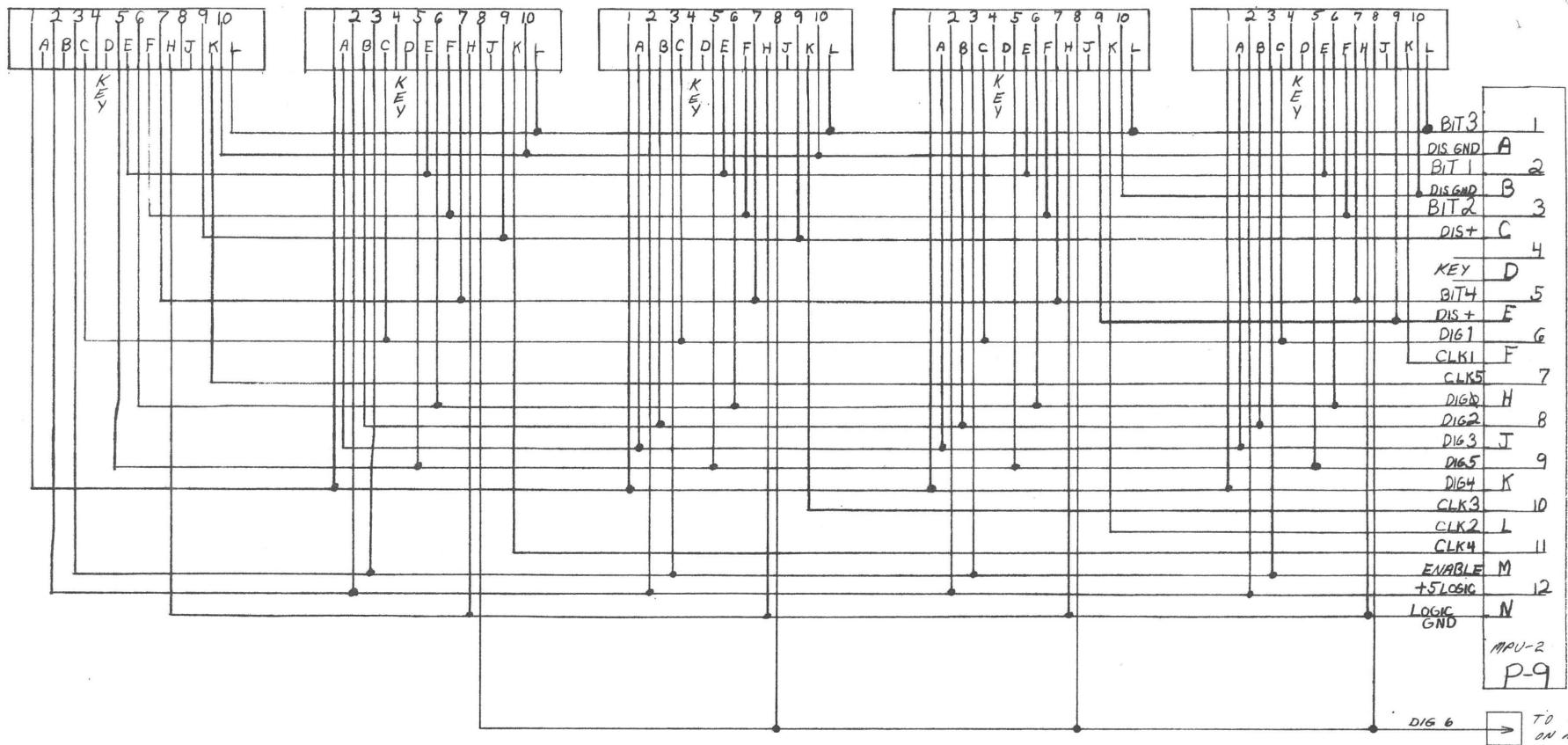
## MATCH-BALL-CREDIT

## PLAYER NO. 4

## PLAYER NO. 3

## PLAYER NO. 2

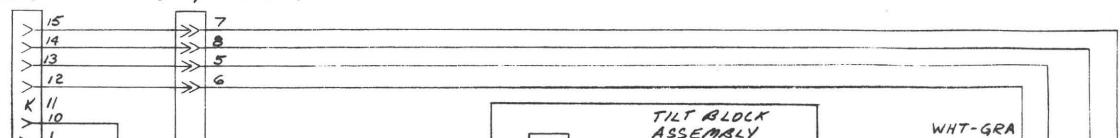
## PLAYER NO. 1



Used On	GAME PLAN Inc. 1515 W. Fullerton Ave Addison ILL. 60101	
PARTS MUST BE CLEAN AND FREE OF BURRS	Scale	Finish
		Drawn By
Tolerances Unless Specified	Date 4-18-79	Amt
Fractional -----	Mat'l	Drawing Number
Decimal -----		02-70019C
Angles -----		
Screw Threads -----		
2 7TH DIGIT ADDED	9-5-80	PINBALL DISPLAY CABLE
ISSUE	CHANGE	DATE

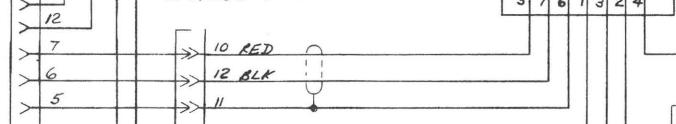
TO J2 OF SDU-1

JP8/JJ8 (BLU)

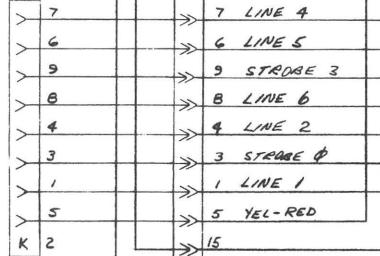


TO J2 OF MSU-1

JP6/JJ6 (WHT)



TO J6 OF MPU



LINE 7

VIO-BLK

BRN-BLU

BLK

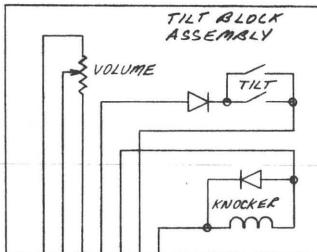
RED-VIO

YEL-GR

GRA-VIO

ORG-YEL

BLK-ORG



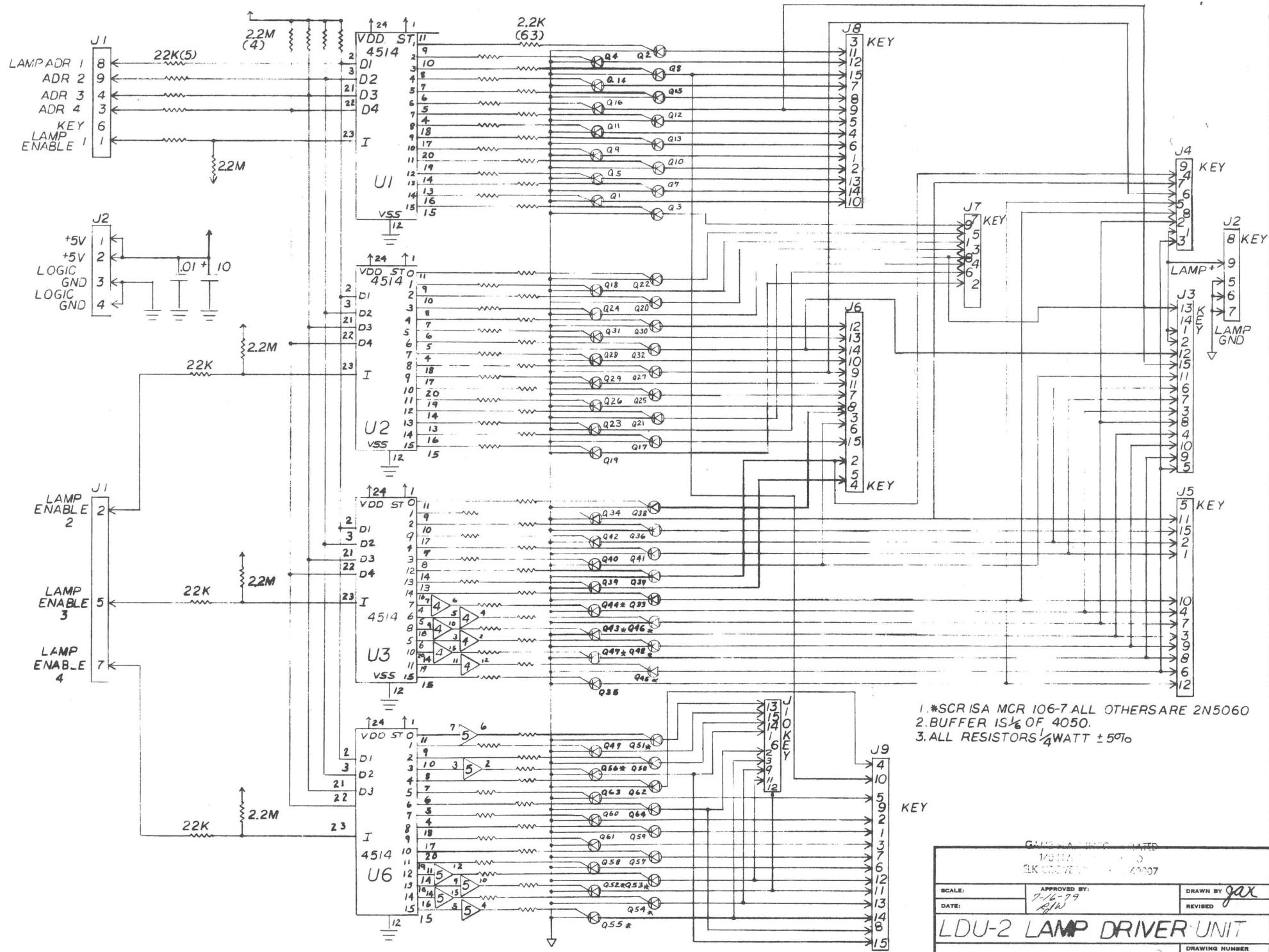
WHT-GR

LEFT FLIPPER

WHT-GR

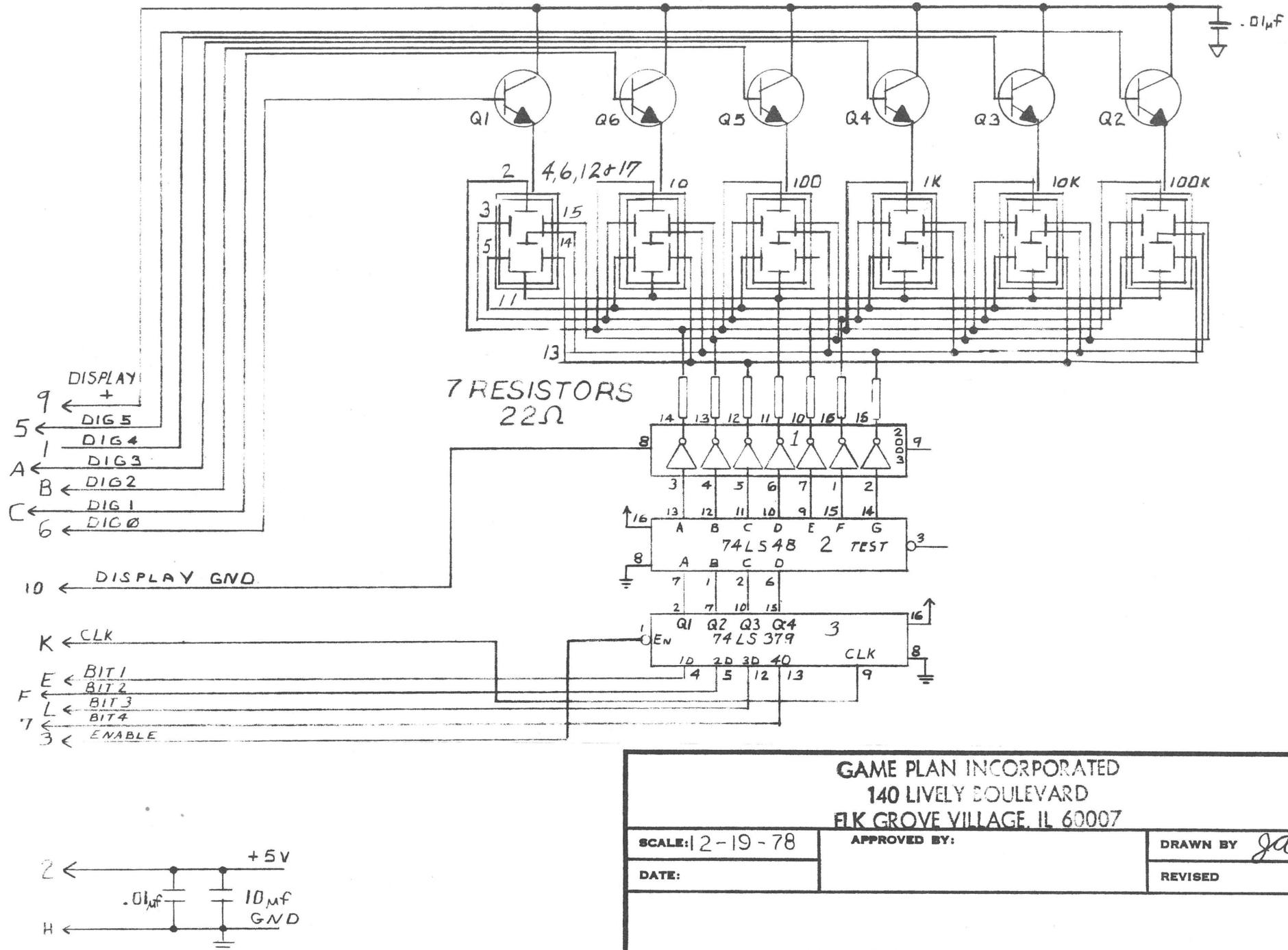
RIGHT FLIPPER

WHT-GR



- 1.\*SCR ISA MCR 106-7 ALL OTHERS ARE 2N5060
- 2.BUFFER IS  $\frac{1}{2}$  OF 4050.
- 3.ALL RESISTORS  $\frac{1}{4}$  WATT  $\pm 5\%$

GAMCO, A. INC. - SAITZ		1483114	8
8000 CLOUTIER DR.		60007	
SCALE:	APPROVED BY:	DRAWN BY <i>jax</i>	
DATE:	<i>7/16/99</i> <i>RJM</i>	REVISED	
LDU-2 LAMP DRIVER UNIT			
		DRAWING NUMBER 02-70013C	



GAME PLAN INCORPORATED  
140 LIVELY BOULEVARD  
ELK GROVE VILLAGE, IL 60007

SCALE: 2-19-78

APPROVED BY:

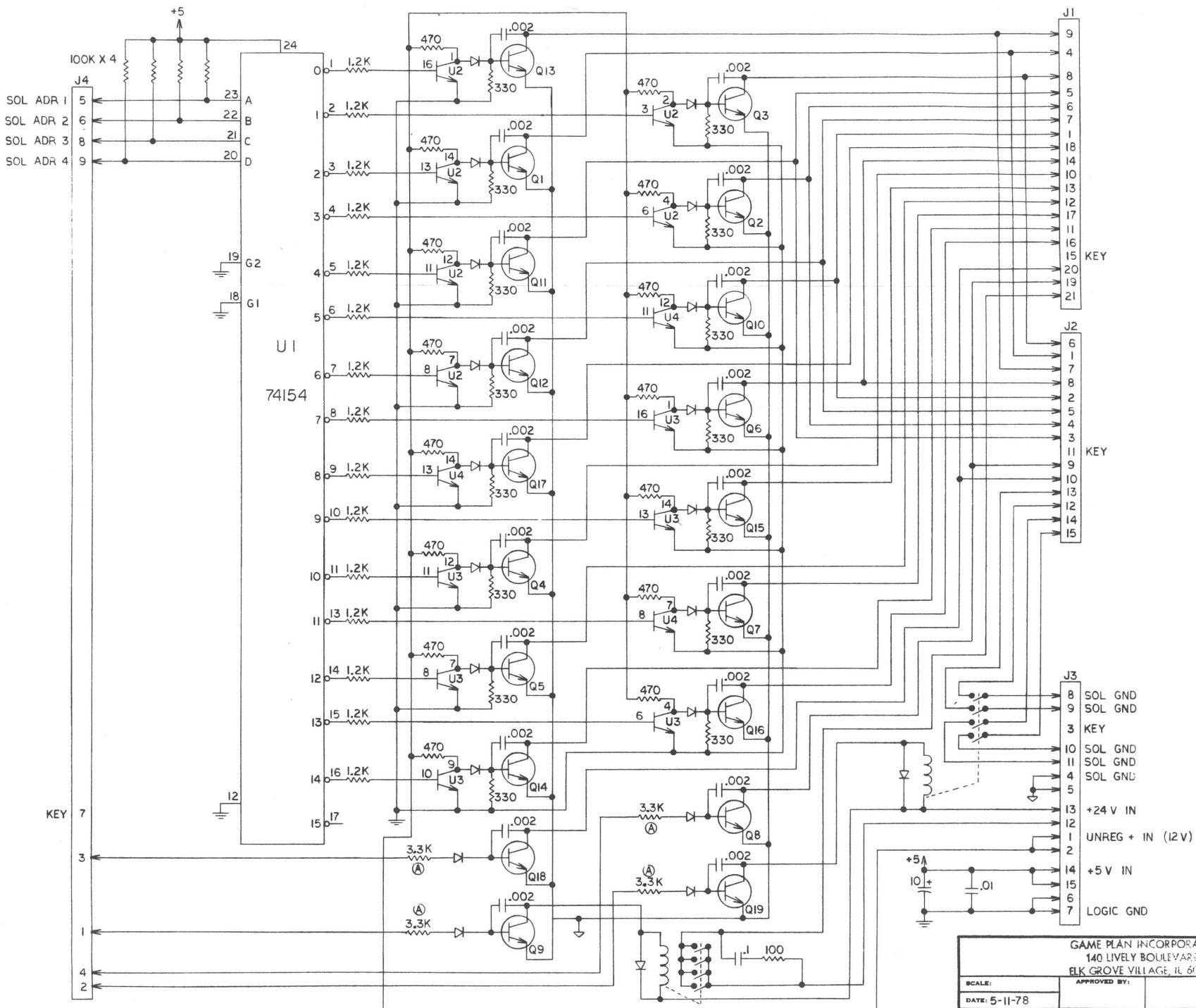
DRAWN BY *JAK*

DATE:

REVISED

BDU - I DISPLAY UNIT

DRAWING NUMBER  
02-70012A



I. ALL DIODES ARE IN4004.

2. POWER TRANSISTORS ARE RCA 121, SE9301, 2N6388, OR EQUIV.  
3. U2, U3, AND U4 ARE ULN2081 OR CA3081. PINS 5 AND 15 GND.

GAME PLAN INCORPORATED  
140 LIVELY BOULEVARD  
ELK GROVE VILLAGE, IL 60007

## SDU-I SOLENOID DRIVER

02-700040

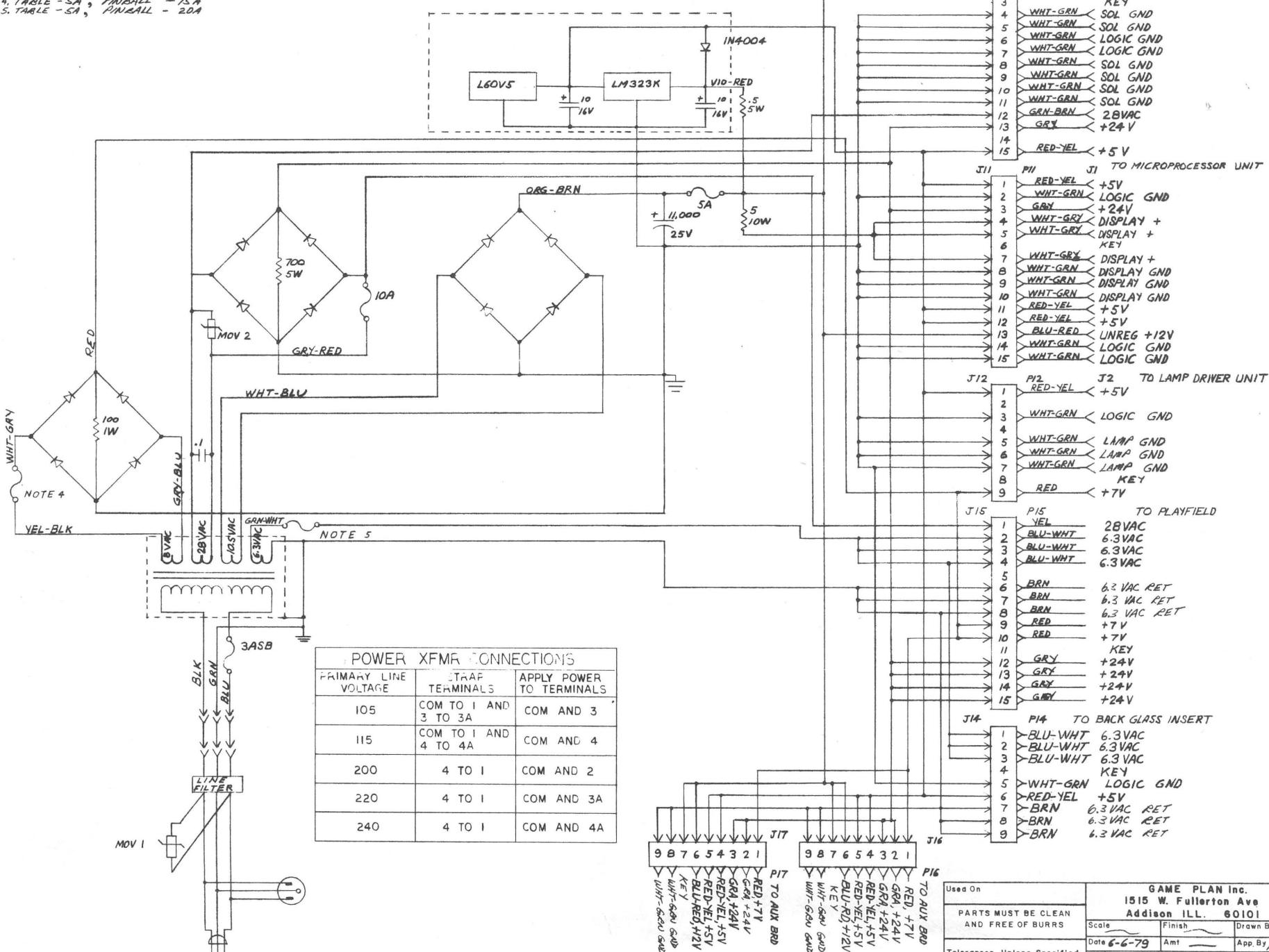
NOTES:  
1. RECTIFIER BRIDGES ARE 25 AMP AND 200 VOLT PIV.

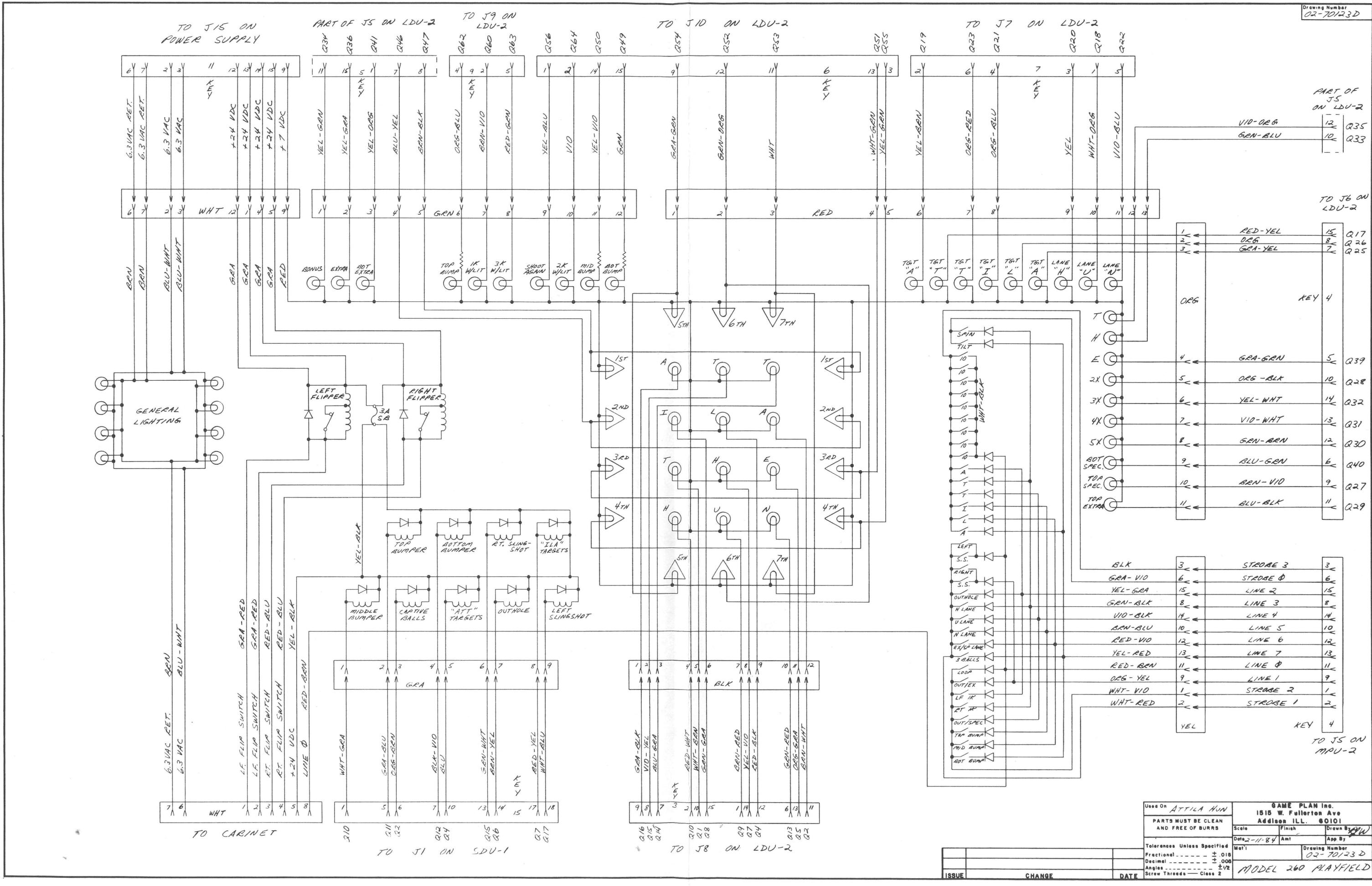
2. MOV 1 IS A V130LA10A FOR 120VAC AND A V250LA20A FOR 240VAC LINE.

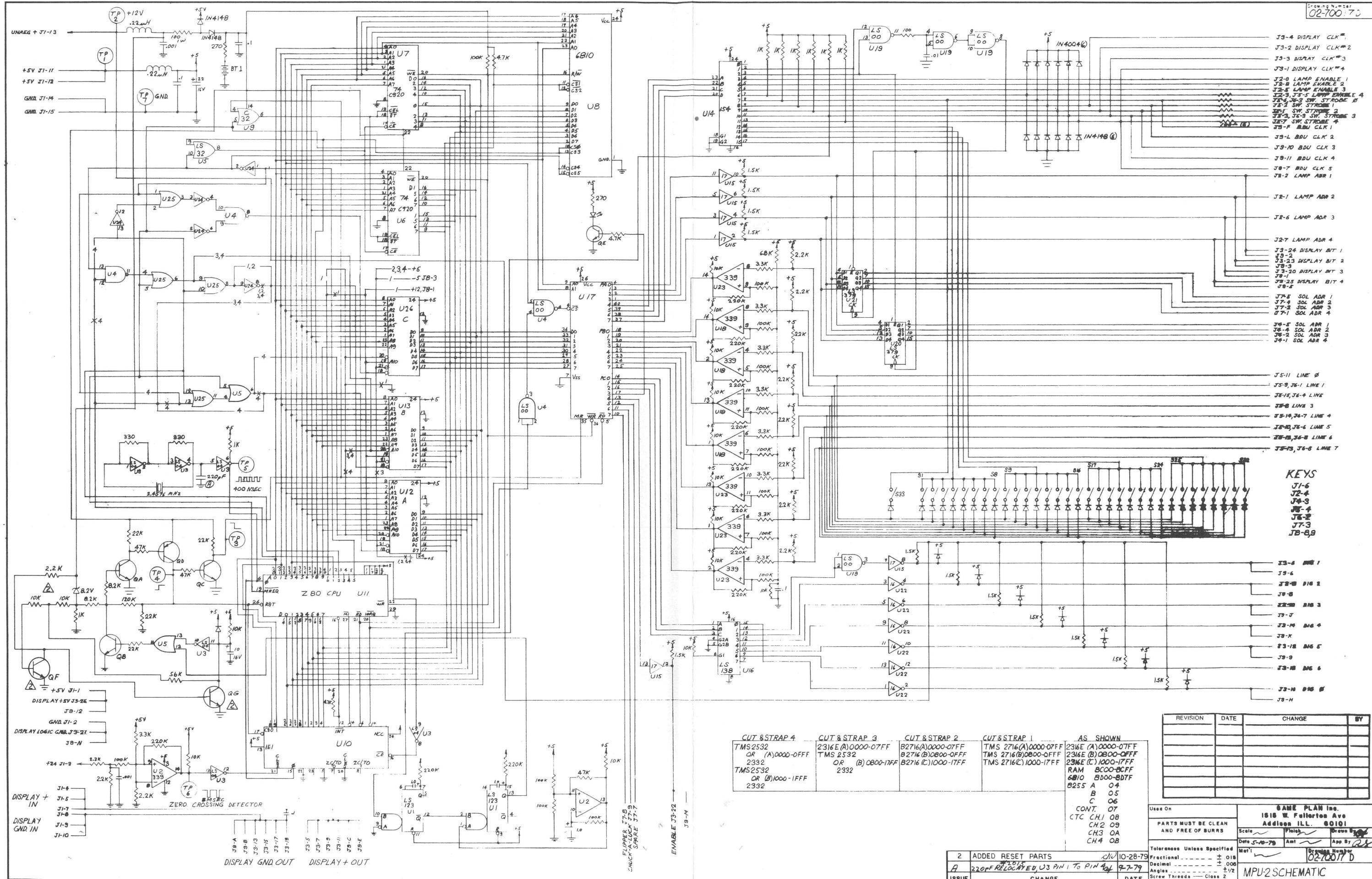
3. MOV 2 IS A V82ZA12.

4. TABLE - SA, PINBALL - 15A

5. TABLE - SA, PINBALL - 20A



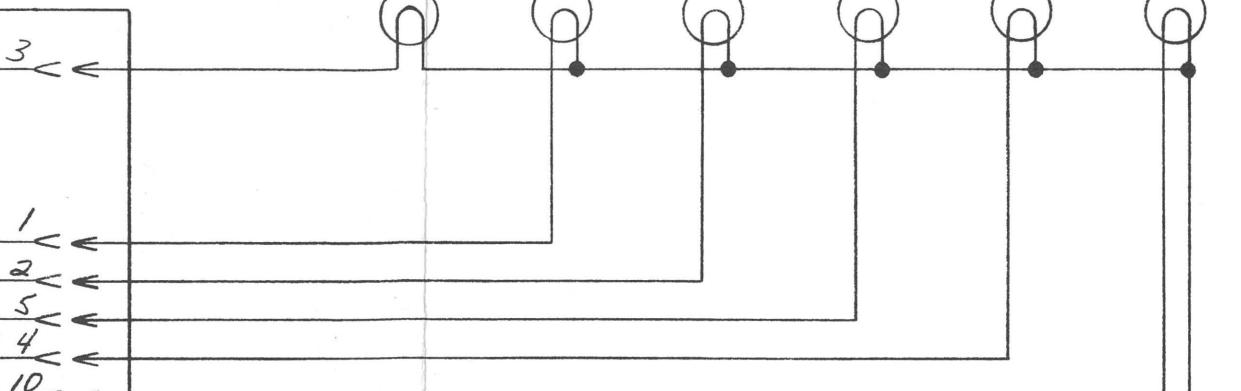




PART OF J6  
ON LDU-2

Q37

BRN-BLU



Q59

GRN

Q61

BRN-BLK

Q57

VIO

Q58

BLU

Q56

YEL-WHT

9 KEY

PART OF J9  
ON LDU-2

Q48

WHT-BLK

Q44

YEL

Q43

BLK-YEL

Q45

WHT-GRN

+7V

RED

14 KEY

J3 ON  
LDU-2

6.3  
VAC

BLU-WHT  
BLU-WHT

4 KEY

6.3 V  
RET.

BRN

BRN

J4 ON  
POWER SUPPLY

Used On	ATTILA HUN	
PARTS MUST BE CLEAN AND FREE OF BURRS	GAME PLAN Inc. 1515 W. Fullerton Ave Addison ILL. 60101	
Tolerances Unless Specified	Scale	Finish
Fractional -----	+	.015
Decimal -----	+	.005
Angles -----	+	1/2
Screw Threads -----	Class	2
ISSUE	CHANGE	DATE

MODEL 260 INSERT